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"THE ACCOUNTANTS' LIBRARY."

VOL. XLVII.

SINGLE COST ACCOUNTS

BY

GEO. A. MITCHELL, A.S.A.A., F.C I.S.

(*Prizeman, Final Examination of the Society of Accountants and Auditors*, 1897.)

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1907

EDITOR'S PREFACE.

THE object of the series of handbooks that is being published under heading of THE ACCOUNTANTS' LIBRARY is to provide, at a reasonable price, detailed information as to the most approved methods of keeping accounts in relation to all the leading classes of industry whose books call for more or less specialised treatment. No such series has hitherto been attempted; but there exist, of course, numerous separate works dealing with the accounts of one particular class of undertaking. These separate works are, however, for the most part either too expensive, or too superficial to answer the purpose that is particularly aimed at by THE ACCOUNTANTS' LIBRARY, which is intended to supply the student with that specialised information which he may require, while at the same time affording to the trader, banker, or manufacturer who is not in a position to secure the fullest information for his purpose, knowledge which can hardly fail to be of the very greatest assistance to him in the correct keeping of his accounts, upon a system specially adapted to his requirements, and therefore involving a minimum expenditure of labour. It is expected that the series will also be found of material assistance to bookkeepers of all classes.

Without aiming at giving an exhaustive account of the manner in which each separate business is conducted, the technical points in connection with each industry will receive as much attention as is necessary in order fully to elucidate the system of accounts advocated, while each volume will be the work of one who has made that particular class of accounts more or less a speciality. It is obvious, however, that to enable the necessary ground to be covered in the space available, it is incumbent to assume upon the part of the reader a certain knowledge of general bookkeeping. The extent of the knowledge assumed will vary according to the nature of the class of accounts considered. For example, in the volumes on "Bank Accounts" and "Shipping Accounts," a thorough acquaintance with ordinary double-entry bookkeeping is not unnaturally assumed; but in the case, for instance, of "Auctioneers' Accounts," "Domestic Tradesmen's Accounts," and other similar volumes, such explanations are included as will enable the ordinarily intelligent reader fully to grasp the methods described, even although his knowledge of bookkeeping may be of an elementary description. These explanations are, doubtless, superfluous as far as accountants are concerned, but are necessary to make the volumes of value to the majority of those specially engaged in these particular industries.

To subscribers for the whole series it may be added that, when completed, it will form a most valuable and practically complete library, dealing, at the hands of specialists, with practically every class of accounts, and illustrating the application

of the theory of double-entry as described in general works on bookkeeping.

The first series (of twenty volumes) has already been completed, and particulars of the subjects dealt with will be found on p. i. A second series (which will comprise about thirty more volumes) is now in progress, which when issued will complete the scheme. Many of these have already been arranged for, but the Editor will be glad to receive suggestions and offers from accountants of experience for the undertaking of volumes not yet announced.

34 Moorgate Street,
London, E.C.
June 1903.

CONTENTS.

EDITOR'S INTRODUCTORY NOTE.

THE organisation of a system of Cost Accounts in any established business depends mainly for its success on the relation of its methods to the lines on which the business has been developed.

A survey of the problems met with in various classes of business shows that lines of organisation, rather than similarity of products, provide the clearest basis for a system of Cost Accounts.

It follows, therefore, that we may classify all industries or undertakings in groups, according to their lines of organisation. By this means we are able to treat separately with the special problems and requirements of each group, and to indicate the methods which are specially applicable to any particular organisation of business.

The grouping adopted in this series will be as follows:—

(1) MULTIPLE COSTS.—Applicable to undertakings where a number of products are involved bearing little or no apparent relation to each other in cost or selling price—such as Engineering Specialities, Cycles, Hosiery, Boots, Furniture, Agricultural Implements—in which standardisation in parts is carried to a high degree of specialisation in manufacturing.

(2) TERMINAL COSTS.—Applicable to undertakings where definite contracts are entered into, in which the costing is definite and terminating—such as Engineers, Shipbuilders, Builders, and the like.

(3) SINGLE COSTS.—Applicable to Breweries, Collieries, Quarries, Mines, and businesses in which there is a natural unit of cost, as the barrel, the ton raised, &c. &c.

(4) PROCESS COSTS.—Applicable to Chemical Industries, Food Products, &c., in which conversion of material takes place, and there are principal and by-products—such as Tanners, Fellmongers.

(5) OPERATING COSTS.—As Railways, Tramways, Gas and Water Undertakings, Electricity, and similar industries.

It is to be noted, however, that there are instances of businesses which, from the special nature of their organisation, except themselves from their own group. The character of their production, and the degree of specialisation attained in the method of manufacture, constitute the only effective basis of decision as to which group they should be classified under.

The present volume deals with the third of these groups, and the volume dealing with Process Costs is in course of preparation. The volumes on Multiple Costs and Terminal Costs have already been issued. Operating Costs having been dealt with, more or less directly, in previous volumes of "The Accountants' Library" (*e.g.*, Vols. VII., XV., XIX., XXIX.), it is not considered necessary to devote a separate number to the subject.

SINGLE COST ACCOUNTS.

INTRODUCTORY CHAPTER.

In this volume the industries taken for the purposes of illustration in describing the principles underlying a system of estimating and costing where a basis of measurement is readily provided are as follow:—

	Unit of Calculation.
Section I.—Malting Business	Quarter.
,, II.—Engineering Business: Building Machines to Standardised Patterns	Set of fifty Machines.
,, III.—Brewery	Barrel.
,, IV.—Colliery	Ton, Coal.

For many reasons these businesses are treated in the following pages on different lines. It would not be practicable to deal with each exhaustively in a small volume. The subjects, although uniform in one way, in that each has a basis of a single article, differ widely in the class of manufacturing details and methods of systematically recording the costing data. Some of the methods more or less applicable to all systems of cost are exhaustively explained in the section on Malting, and these methods may be readily adapted to the cost accounting and business requirements of the other concerns described in less detail. Again, there are several well-known treatises dealing with the book and account keeping of important industries, such as Breweries and Collieries.

It may be well to set out by way of general introduction the main lines which have been followed in writing the several sections.

SECTION I—MALTING BUSINESS.—In this case a full set of accounts—Balance Sheet, Profit and Loss Account, Trading Account (sectional), Barley Accounts, and Malting Accounts—are given.

The main features of the buying and selling records are described in detail, forms are given for practical application, and the working out in detail of the reconciliation of the estimates at the commencement of the season with the actual results, as shown by the annual accounts just mentioned, at its close.

In the following sections, where it was found that illustrations or descriptions were likely to overlap and cause redundancy, care was taken to include only new forms and treatment specialised to the peculiar requirements of the industry immediately under review.

SECTION II.—ENGINEERING BUSINESS (STANDARDISED SHOP). Standardisation alone brings this class of business within the scope of "single" costings. Were the factory organised on different lines the cost accounting might be more effectively and efficiently conducted under the system described in "Multiple Costs," by H. Stanley Garry, who deals with the costing of "parts" and the incidence of shop expenses on the material and labour contained in these parts in a comprehensive and suitable manner.

In this section the Balance Sheet, Manufacturing Accounts, &c., are also given as a good means of grasping the nature of the business for which the costs are required, and showing the class of account aimed at and the results that should ultimately be exhibited.

The accounting, commercial and factory, for this business is prepared on a scheme which will afford an illustration of simplicity in detail working, while at the same time retaining all the essentials of good bookkeeping and cost recording.

The distribution of the Shop Expenses is also explained and illustrated.

SECTION III.—BREWERY.—The subject of Brewery Accounts has been so fully treated at the hands of competent authors—in works such as "Brewers' Accounts," by William Harris; and "Brewers' and Bottlers' Accounts," by Herbert Lanham ("Accountants' Library," Volume XLIV.); and in the "Brewing Trade Review," by John J. B. Arter—that there does not appear to be occasion for including illustrations of accounts and forms used in the trade.

The section is therefore confined to *pro formâ* costing, and the agreement of the results shown at the end of the year by the commercial books and the brewing (production) records respectively.

SECTION IV.—COLLIERY ACCOUNTS.—The observations made in connection with the subject treated under Section III. are also applicable to the accounts of collieries. The matter has been ably handled by lecturers and fully recorded in the pages of *The Accountant*, the commercial accounts, as also the organisation and administration being described.

Moreover, it is generally found that concerns engaged in the two last-named industries have good systems of commercial accounting, and also, as a rule, cost records which appear to meet their requirements. There may be exceptions, but as a rule the bookkeeping is on sound lines.

In this section, therefore, the illustrations are devoted mainly to showing as clearly as possible the results which may be obtained from the periodical Cost Sheets of a colliery, and the agreement it is necessary to establish with the Working and Trading Accounts of the colliery for the periods covered by the Cost Sheets.

SECTION V.—STOCKTAKING.—A section is devoted to the consideration of questions arising out of the annual (or periodical) stocktaking; record of quantities and values; and the principles underlying the correct survey of the material, goods, and work on hand at a given date.

SECTION VI.—CARDS.—A section is also included showing how cards, &c., may be employed with advantage in the businesses referred to, and for account and record keeping generally.

Cost Records.—

The aim throughout has been to avoid any system which in its working involves clerical labour and cost-keeping incommensurate with the results afforded. Simplicity and practicability are claimed for the methods described or outlined in these pages. One frequently hears a manager say that were it not for the additional clerical staff required, and the countless records of detail involved, he would certainly have put into operation forthwith a system of factory accounting. He probably adds, as an example of the difficulties he foresees, "that a system which provides for a requisition being signed by a foreman, and countersigned by an official, before a workman may draw from the stores a farthing candle so that he may see to execute some repair in the floor pit of a large machine may do in some works, but it is not suitable to his business."

Undoubtedly the stores problem blocks the way in many attempts at correct cost-keeping. It is a comparatively easy matter for cost clerks, with the assistance of works like that of Garcke and Fell, or one of the many lectures and articles on factory accounting appearing in the American engineering magazines, taken in at practically all the engineering shops in this country, to design and adapt cards and forms, and thus institute a fairly complete system of costing, but to be really

effective and profitable there must always be considerable expense attending its working.

Having gone a certain length, it is necessary that the scheme be completed in its utmost detail. The expense must be ascertained at the outset and the plan arranged. A case came under the writer's notice recently where a very comprehensive system had been set on foot in a large works by one claiming to be an expert in factory records. It evidently had not yet been complete in every detail, and the manager, in despair, had remarked "Cards and records everywhere, but information nowhere."

That some good check on the stock of finished parts and stores should obtain, if practicable, is admitted by all. The case of the large engineering company in Scotland which is reported, in the course of a recent prosecution for conspiracy by certain workmen, to have lost some £10,000 in three years through finished parts being stolen from the shops, forcibly illustrates the risk of serious loss. There is also the loss through wastage, which is likely to be much heavier in the absence of any check.

There are two methods, either of which will allow of a cost system gathering up the details of the parts and stores, and at the same time checking with more or less accuracy their proper disposition:—

I.—The method which provides a check by means of clerical record of every movement and operation (machine and hand), of every article, or quantity, as it passes to and fro in the shops. This, to be useful, must be complete, and to be complete it must be expensive in its administration. Unfortunately, even this method is no safeguard against conspiracy. It is conceivable that the very records themselves may become instruments in the hands of employees in collusion.

II.—The method which simply affords a check on classes and descriptions of goods in the aggregate. The further the

division and sub-division goes the more closely may the goods be watched and checked. This plan is simple in its bookkeeping detail, and provides an approximately correct test on the material, parts, &c., as bought, stored, manufactured, &c.

The second method is the one usually employed in this volume, as it affords sufficient data for costing purposes.

The ultimate decision in adopting a system must always rest on the cost of working it. If a man computes he is likely to lose at the most, say, £200 per annum through factory irregularities, he cannot afford to pay £500 per annum to check his stores. On the other hand, a large firm, which is liable to be robbed at the rate of £3,000 a year, can afford to pay an expensive staff, on the principle of indemnity or insurance against such loss.

Putting the difficulty of the stores in another way, it will usually be found that most manufacturing businesses can be departmentalised with practically no additional staff to that required for ordinary commercial purposes. Surely it is better, therefore, to have the departmental accounts showing the grand result of the year divided in, say, five sections, each of which may be criticised and tested by means of its own records and personal knowledge peculiar to the department, than that the total result for the period should be accepted without investigation, it being found impracticable to critically examine the latter, on account of its volume and variety.

NOTES.—The following are a few general observations on questions which arise in almost every system of business cost-keeping, which may be found useful in considering the accounts and illustrations contained in this volume, and in adapting the same to practical purposes.

Organisation.—

The organisation of the factory determines the system of costing best suited to its requirements. The Cost Accounts may be essential to the efficient administration of the works, but nevertheless they are also incidental thereto, and must not become disproportionate.

Factory Output.—

It is necessary for all concerned to have a clear grasp of the effective and profitable output of the works. This standard may be prepared on annual, monthly, or weekly lines, and should have in every department of the manufacturing and in each selling department its corresponding measurement. The works manager must obtain his maximum output, irrespective of selling contingencies, if he is to show a profit as a manufacturer. The commercial manager must either make his market or warehouse the finished stock, whichever course he by experience and calculation finds most beneficial.

Cost Clerk.—

The principal cost clerk should be an expert in the costings suitable to the business. Practical knowledge of the workshop, combined with that of bookkeeping, is required. It is not necessary that he should be an accountant, in the professional acceptation of the term, but it is essential that he should have sufficient practical training to enable him, instinctively as it were, to note the omission from a costing of a part or operation, or, on the other hand, to tell that a certain article included could form no component of the costing before him.

The best cost clerks are men who have been well grounded in the Time, Wages, and Stores Departments. Occasionally one is found who has worked at the bench, as a fitter or skilled mechanic to begin with, and having acquired a knowledge of account-keeping has entered the Cost Office. His twofold knowledge equips him for the post.

Storekeeper.—

The place of storekeeper should also be occupied by a man of ability and experience, as so much depends, as has already been shown, on the records for which he is primarily responsible. If the whole works are supplied from a general stores it is important that the head storekeeper should thoroughly understand the whole system of factory cost. In the large works there may be several stores—*e.g.*, Purchased Stores (Raw Materials and Running Expenses), Manufacturing Stores (completed parts), and a Finishing Stores. In highly organised factories each shop or department has its own stores. The storekeeper in these cases should have a special knowledge of the work and requirements of his own shop.

Secrecy.—

In many a small business an effort is made by the principal to retain in his own hand all information regarding the cost of production of an article, and the reason for this is clear. It causes, however, either incompleteness or overlapping in the accounts and produces indifferent results. Better to have confidence in those placed in responsible positions, and allow a scheme of costings suitable to the business to disclose the results naturally. In the larger concerns the difficulty is not met with.

Secret processes in a business enjoying a monopoly must be specially safeguarded, both as regards manufacture and records of cost. However, even these may be kept unduly private with disastrous results.

Bookkeeping: Ledger Accounts.—

In establishing an adjustment between the commercial books and those accounts and records kept for the factory and costing production, it is well not to have too many Nominal Accounts

opened in the former. This reduces clerical work in the general office side, and allows of more clerical work being devoted to the dissection necessary to the cost records. Main or controlling accounts only should be opened in the Nominal Ledger, but in the works records—be they Journals, Waste Books, Cards, or Work Sheets—the dissection cannot be carried too far, so long as there is a main heading governing the sub-division.

This plan also applies with equal advantage in the counting-house. Many Impersonal Accounts in the Ledger will at times cause confusion. There cannot be an account opened for every differing item of expense, and occasionally the best grouping will mislead. The suggestion is therefore to open accounts for the main and well-recognised heads of receipts and expenditure only, and to have a subsidiary book kept in the fullest detail by means of columns. This will allow of the most minute details of the business being thrown open to inspection and criticism from week to week. The information thus compiled will also afford means of compiling annual accounts and comparisons on the most graphic lines.

Manufacturing and Trading Accounts.—

In the following pages, where an account is prepared to show the factory value of the manufactured production, the account is styled "Manufacturing Account," and the output has no direct relation to the Selling Department of the business and its turnover.

The Material Consumption, Labour Bill, and Works Running Expenses have in a working mill been converted during a given period into a certain measurable production, and it is the object of the Manufacturing Account to record and measure the same. The standard of measurement must always be quantity—volume, not selling value, if the efficient working of the manufacturing side of the business is to be truly gauged and regulated.

It is necessary to mention this, as there still appears to be a system of teaching under which it is held that the manufactured production of a concern may be measured and compared by means of the sales turnover, a fluctuating factor subject to all manner of sensitive conditions.

There are isolated cases where the sales basis may be established with no serious risk of error, but from the cost accountant's point of view it is well to exclude the selling price in all costing calculations, unless, indeed, it is in the case of a conference with the head of the Commercial Department when the question of Margins, Distribution Charges, and Profits are being discussed.

Uniformity.—

It is important to see that uniformity is observed in the classification of expenses, whether these are directly or indirectly chargeable. The main heads having been settled, it is well to have a schedule settled by the manager, in consultation with the cost accountant, clearly specifying to the smallest detail under which heads all items of expense are to be included. There should be no possibility of sundry, extraordinary or otherwise, payments and charges arising at stocktaking, or other time, which have not been provided for in the general scheme. If the manager is to rely with confidence on his short-date records he must feel that his accounts and records are gathering up all outgoings.

General.—

It is unnecessary to point out that the figures are purely hypothetical. The ratios of capital, production, profit, interest, &c., one to another, prices given, departmental proportions, volume of trade, and all amounts and quantities are illustrative only, and designed to demonstrate the practical working out of costings rather than to establish a basis of factory organisation.

SECTION I.

MALTING BUSINESS.

BALANCE SHEET, October 7th 1905.

Liabilities	£ s d	£ s d
SUNDRY CREDITORS:—		
For Barley supplied	479 6 3	
Tradesmen's Accounts	173 16 3	
Accrued Charges	78 11 9	
		731 14 3
PARTNERS' CAPITAL:—		
Balance at October 6th 1904	15,026 16 5	
Profit for Year	1,584 14 6	
		16,611 10 11
		£17,343 5 2

Assets		£ s d	£ s d
CASH:—			
At Bank		1,603 10 3	
In hand		60 3 2	
			1,663 13 5
BOOK DEBTS		2,503 10 5	
Less—			
Reserve for Discounts ..	£60 10 0		
" " Doubtful Debts	127 0 0		
		187 10 0	
			2,316 0 5
STOCKS:—			
Barley		2,791 8 4	
Malt		741 13 0	
Screenings and Culms		43 5 0	
			3,576 6 4
MACHINERY:—			
Value at October 6th 1904		500 0 0	
Additions to date		40 0 0	
		540 0 0	
Less Depreciation at 7½ per cent. ..		37 10 0	
			502 10 0
HORSES, WAGONS, AND HARNESS, as per Inventory		..	203 10 0
UTENSILS, as per Inventory		..	180 0 0
SACKS:—			
Value at October 6th 1904		250 0 0	
Additions to date		30 0 0	
		280 0 0	
Depreciation, 12½ per cent.		31 5 0	
			248 15 0
LABORATORY EQUIPMENT		..	252 10 0
FREEHOLD KILNS AND WAREHOUSES ..		..	8,400 0 0
			£17,343 5 2

PROFIT AND LOSS ACCOUNT for Year ending October 7th 1905.

	£ s d	£ s d		£ s d	£ s d
To Bank Interest	..	37 10 0	By Balance from Trading Account ..	..	1,164 5 0
" Audit Fee	..	52 10 0	" Sack Hire	36 0 0	
" Insurance of Fixed Charges and Net Profit	..	6 15 0	*Less* Depreciation of Sacks	31 5 0	
" Income-tax	..	37 10 6	" Estate Account:—		4 15 0
" Balance, being Net Profit..	..	1,584 14 6	Rents charged to Kiln Accounts ..	700 0 0	
			Less Repairs to Property and Landlord's Taxes	150 0 0	550 0 0
		£1,719 0 0			£1,719 0 0

TRADING ACCOUNT for

	A					B				
	Qrs.	Rate	£	s	d	Qrs.	Rate	£	s	d
To STOCKS at October 6th 1904:—										
Malt, English	100	36/-	180	0	0					
" Foreign	230	31/-	356	15	0	1,000	29/6	1,475	0	0
Screenings..	10	20/-	20	0	0	30	15/-	22	10	0
Culms	..	6 tons at 60/-	18	0	0	..	20 tons at 60/-	60	0	0
" MALT, from Malting Account:—										
English	2,493	34/3·55	4,275	0	0					
Foreign	561	31/6·35	884	8	3	6,480	29/3	9,476	3	4
" CULMS, ditto .. (24¼ tons)	..	60/-	72	15	0	..	50 tons at 60/-	150	0	0
" SCREENINGS, from Barley Account	69	20/-	69	0	0	..				
" Ditto ditto	26	15/-	19	10	0	550	15/-	412	10	0
" DELIVERY, &c., EXPENSES:										
Horse-keep and Stable Expenses, Carriage, &c.	..	..	296	10	0	..	..	85	0	0
Local Office Expenses ..	..	..	80	10	0	..	..	150	0	0
" Balance down	..	..	578	1	0	..	..	1,335	18	11
	3,489		£6,850	9	3			£13,167	2	3

MANAGEMENT AND GENERAL EXPENSES:—						£	s	d
To Salaries	..	..	..	..	..	500	0	0
" Laboratory Expenses (General)	..	..	..	..	..	53	7	6
" Sack Incidentals..	..	..	..	..	..	15	6	0
" Travelling Expenses	..	..	..	..	..	70	6	9
" Head Office Rent, Rates, and Expenses	..	..	..	..	..	161	7	11
" Depreciation of Machinery	..	..	..	..	..	37	10	0
" Balance, to Profit and Loss Account	..	..	..	..	..	1,164	5	0
						£2,002	3	2

Year ending October 7th 1905.

	A				B			
	Qrs.	Rate	£ s d		Qrs.	Rate	£ s d	
By SALES :—								
Malt, English	2,250	41/6	4,668 15 0					
" Foreign	750	35/-	1,312 10 0		7,405	33/6	12,403 7 6	
Screenings	100	22/6	112 10 0		570	15/6	441 11 0	
Culms	..	30 tons at 66/-	99 0 0		..	60 tons at 65/-	195 0 0	
" STOCKS at October 7th 1905 :—								
Malt, English	343	34/3	587 7 9					
" Foreign	41	31/6	64 11 6		75	29/3	89 13 9	
Screenings..	5	20/-	5 0 0		10	15/-	7 10 0	
Culms	..	5 cwts. at 60/-	0 15 0		..	10 tons at 60/-	30 0 0	
	3,489		£6,850 9 3				£13,167 2 3	
						£ s d	£ s d	
By Balances down :—								
A Kiln			..		..	578 1 0		
B Kiln			..		..	1,335 18 11	1,913 19 11	
" Cash Discounts received			..		..	153 2 6		
Less Allowed			..		..	75 1 3	78 1 3	
" Allowances (Farmer's Barley, 1/- per 10 qrs.) ..			..		..	..	10 2 0	
							£2,002 3 2	

KILN

English Barley Account,

	Qrs.	Per Qr.	£ s d
To Stock, October 6th 1904	450	30/-	675 0 0
" Barley Purchases	2,020	30/6	3,080 10 0
" Carriage and Cartage	..	-/9·50	79 19 2
" Surplus in Barley	5		
	2,475		£3,835 9 2

Foreign Barley Account,

	Qrs.	Per Qr.	£ s d
To Stock, October 6th 1904	21·6	25/-	27 0 0
" Barley Purchases	800	24/-	960 0 0
" Freight and Carriage	..	3/-	120 0 0
	821·6		£1,107 0 0

Malting Account,

	Qrs.	Per Qr. steeped	£ s d
To English Barley steeped	2,397	31/3·67	3,752 7 6
" Foreign Barley steeped	540	28/11·11	781 0 0
" Malting Expenses :—			
Wages	..	£180 0 0	
Rent, Rates, and Taxes	..	263 0 0	
T. c. Average			
Coal and Carriage (63·4 1·5/-).. ..	..	79 3 9	
Coke and Carriage (125 18/-)	..	112 10 0	
Gas and Water	..	22 0 0	
Laboratory Expenses..	..	12 12 0	
Insurance	..	4 10 0	
Maintenance and Repairs, Utensils, &c.	..	25 0 0	
		4/9·10	698 15 9
" Malt gained: 4 per cent. on steep	117		
	3,054		£5,232 3 3

A.

SEASON 1904-5.

	Qrs.	Per Qr.	£	s	d
By Screenings	69	20/-	69	0	0
" Stock, October 7th 1905	9	31/3·50	14	1	8
" Barley steeped, to Malting Account	2,397	31/3·67	3,752	7	6
	2,475		£3,835	9	2

SEASON 1904-5.

	Qrs.	Per Qr.	£	s	d
By Screenings	26	15.-	19	10	0
" Barley to B. Kiln	200	25/3	252	10	0
" Stock, October 7th 1905	40	27/-	54	0	0
" Barley steeped, to Malting Account	540	28/11·11	781	0	0
" Shortage in Barley..	15·6				
	821·6		£1,107	0	0

SEASON 1904-5.

	Qrs.	Per Qr. steeped	£	s	d
By English Malt produced to Trading Account ..	2,493	34/3·55	4,275	0	0
" Foreign Malt produced	561	31/6·35	884	8	3
" By-Product :—					
Culms, 24 tons, 5 cwt. at £3	..	..	72	15	0
	3,054		£5,232	3	3

KILN

Barley Account,

	Qrs.	Per Qr.	£ s d
To Stock, October 6th 1904	1,000	25/-	1,250 0 0
" Foreign Barley Purchases	7,500	22/-	8,250 0 0
" Freightage, Lightering, and Warehousing	..	3/4	1,250 0 0
" Barley transferred from Kiln A	200	25/3	252 10 0
	8,700		£11,002 10 0

Malting Account,

	Qrs.	Per Qr. steeped	£ s d
To Barley steeped	6,000	26/2·66	7,866 13 4
" Malting Expenses :—			
Wages	..	450 0 0	
Rent, Rates, and Taxes	..	760 0 0	
T. c. Average			
Coal and Carriage (208·7 24/-)	..	250 0 0	
Coke " " (140 17/6)	..	122 10 0	
Gas and Water	..	85 0 0	
Laboratory Expenses	..	25 0 0	
Insurance	..	11 0 0	
Maintenance and Repairs, Utensils, &c.	..	56 0 0	
		5/10·38	1,759 10 0
" Malt gained, or 8 per cent. on steep	480		
	6,480		£9,626 3 4

B.

SEASON 1904-5.

	Qrs.	Per Qr.	£	s	d
By Screenings transferred to Trading Account.. ..	550	15/-	412	10	0
" Stock, October 7th 1905	2,150	25/4	2,723	6	8
" Barley steeped, to Malting Account	6,000	26/2·66	7,866	13	4
	8,700		£11,002	10	0

SEASON 1904-5.

	Qrs.	Per Qr.	£	s	d
By Malt Produced (at cost), to Trading Account ..	6,480	29/3	9,476	3	4
" By-Product :— Culms, 50 tons at £3 .. .. (or 5·14 per cent. on Malt made).	..	..	150	0	0
	6,480		£9,626	3	4

MALTING BUSINESS.

The Balance Sheet, Profit and Loss Account, and Departmental or Sectional Accounts set out in the foregoing pages are prepared from a Trial Balance of the books and accounts of the business in the ordinary way.

As this work does not essay to deal in an exhaustive manner with the business methods and management of a malting business, it has not been deemed necessary to burden the section with detail in matters arising out of ordinary accountancy and bookkeeping, the principles of which the reader is assumed to be familiar with.

The object in view is to illustrate from the accounts of a concern, which affords a ready unit of calculation and measurement, the working and practical application of "Costings," and in this case the sub-division of the subject referred to in the preface as "Single Costings."

Before proceeding to treat with the day-to-day routine required in attaining this object, it is believed it will be advantageous to fully consider the Balance Sheet and other accounts of the business herewith submitted, and it need scarcely be pointed out that the case taken is a purely hypothetical one—an illustration only.

BALANCE SHEET.

Cash and Working Capital.—

The Balance Sheet here presented represents a statement of the position of the business at the close of the season, the transactions of which it is proposed to discuss. Taking the assets' side first, and considering the heads there set out *seriatim*, the first item is "Cash," and at the close of the season, on October 7th, there is a balance available amounting to £1,663 13s. 5d.

The concern is capitalised on a basis proportionate to its "steep" capacity and out-turn of malt, and the working capital in the business is sufficient to allow of normal working under the ordinary conditions of trade.

During the months from November to March the barley buying from farmers in the local markets is taking place, and, as the terms are generally cash in ten days from date of delivery, the cash outgoings are much in excess of the receipts in respect of malt sales, the latter taking place on a fairly uniform basis all the year round.

The foreign barleys, purchased through brokers mainly, may be taken as payable on terms averaging payment in thirty days, the cheques being issued against documents as the cargo is discharged.

In order to provide capital for the working of the business during the period when the purchases are out of proportion to the sales, arrangements are made with the bankers for temporary accommodation, the Profit and Loss Account showing that this obligation costs the firm £37 10s. (say £2,000 at 5 per cent. for four and a-half months). This payment is regarded as a charge against profits, and not included in the scheme of cost.

Book Debts.—

The Sundry Debtors for Malt, Screenings, and Culms supplied, appearing in the firm's books on October 7th 1905, amount to £2,503 10s. 5d., and represent the average sales for one month, plus certain accounts, the terms of which vary from two to three months. Included in the latter is the usual percentage of unsatisfactory accounts.

These doubtful debts are specially provided for, each account on its merits, and the reserve under this head amounts to £127.

The trade terms are nominally "Net cash in a month," but a custom has arisen of allowing certain customers a small dis-

count; these are specially abstracted from the Ledgers and allowed for in the Balance Sheet, and amount to £60 10s.

It will be observed from the Trading Account that the total discounts received for the year amount to £153 2s. 6d. only, or less than 1¼ per cent. on the turnover.

Stocks.—

The stocks appearing in the Balance Sheet are the results of the annual survey and measurement of the grain in bulk and sacks in the warehouses, and the malt in the kilns and warehouses. There was no grain in transit at the date of stocktaking. The prices are those exhibited by the Cost Accounts —viz., cost price.

As will be seen from the costings and relative accounts and schedules submitted later, the "balances" on the Barley Accounts and Malt Accounts (Nominal Ledger Accounts) are actual stocktaking figures, all adjustments in respect of surplus or shortage in barleys having been made, and the resulting gains or losses carried into the costings.

For convenience in reference it may be well to point out at this juncture that the stock figure in the Balance Sheet is arrived at thus:—

STOCK, October 7th 1905.

	Kiln A.	Kiln B.
	£ s d	£ s d
Barley—English	14 1 8	
Foreign	54 0 0	2,723 6 8
Malt—English	587 7 9	
Foreign	64 11 6	89 13 9
Screenings	5 0 0	7 10 0
Culms	0 15 0	30 0 0
	£725 15 11	£2,850 10 5
Total as per Balance Sheet	..	£3,576 6 4

As has been already pointed out, these stocks are the results of actual physical measurement, it being necessary to prove and test the warehouse and kiln records with those of the counting-house. It will be shown, however, that by adopting a satisfactory system of warehouse and kiln bookkeeping the "book stocks" may with reasonable accuracy be accepted for intermediate stocktakings and monthly or other interim data.

Machinery.—

The plant in the case under consideration is not a heavy item, and represents principally screening machines for the preparation of the barleys.

The general maintenance of the plant is charged to the Trading, and all tangible additions placed to Machinery Account. These during the year amounted to £40. Depreciation at the rate of 7½ per cent. per annum, on original cost, is written off, and, although this rate is regarded by the firm as more than adequate for the immediate purpose, it is understood that any over-provision will allow of modern appliances being acquired as they come on the market, and this probably without materially adding to the average total value of the plant. A provision is thus being made for obsolescence.

The depreciation amounts to £37 10s., and is charged direct to the Trading Account. At first sight one would think it would be better apportioned and charged to the respective Kiln Accounts. The machinery is required, however, in connection with the barley, as distinguished from the malt, and it is well to keep the Barley Account simply as a "Goods Account," without expenses other than carriage inwards entering therein. Further, the item, unlike the corresponding one in the Balance Sheet of an engineering business, is small, and of little practical account in the costings.

Horses.—

An inventory is taken every year, and each horse, cart, set of harness, and other stable requisite put down at its value. All purchases are charged to a Nominal Account, and, after crediting the closing inventory, the debit balance forms part of the general Horsekeep Account, which is distributed over the cost of the inward barleys and outward malts. This expense, as in the case of railway carriage or freightage, is an element in the first cost of the former, and adds to the selling expenses of the latter.

Utensils.—

The working implements—such as malt-shovels, barrows, screens, &c.—are also taken at their annual value. All new implements purchased, and repairs effected, are charged to this account, and the stock value at the close of the season credited, the balance being written off as a maintenance charge against the respective kilns and an account of the utensils at each malting kept at the Head Office.

Sacks.—

There are various ways of dealing with the sacks in a business of this kind. It is not unusual to have a proper sack stocktaking once in every three years, and at the dates of the intervening financial stocktakings to accept the balance of sacks as shown by the Sacks Ledger as correct. It is not deemed necessary to enter into the details of a good sack system here, but let it be sufficient to say that there should be a debit and credit account running with every supplier of barley on the one hand, and every customer for malt on the other, and that, in addition to this warehouse and kiln check on the sacks, the Head Office, by means of an extra column in their Malt Sales Day Books and Ledgers, should have a complete check on the malt sacks. As regards the barley sacks, a Barley Sack Ledger is kept on debit

and credit principles, and posted up from the dockets referred to later, which shows at any date the balance of sacks in the hands of farmers, in the sack stores, or elsewhere.

Laboratory.—

The laboratory apparatus, vessels, and general equipment are taken at a normal figure representing the initial cost. It is fully maintained and kept up to date out of revenue, and only in the event of considerable extensions would the outlay be capitalised. The working expenses of the laboratory are charged, where possible, to the respective maltings, and the balance (*e.g.*, £53 7s. 6d.) to the General Trading Account.

Freehold Kilns and Warehouses.—

The Freehold Property stands at its original cost. The Kilns, being modern ones and well maintained out of revenue, are worth the figure at which they appear in the accounts. As regards the Kiln Rents, for costing purposes these are charged against the individual Kiln Accounts at an agreed amount (Schedule A assessment, before deduction of one-sixth for repairs), and the sums credited to an Estate Account. The rents treated in this way for the year amount to £700 (8.33 per cent. capital value), and all landlord's rates and the cost of repairs and upkeep of the buildings are chargeable against this amount. For the period these have amounted to £150, and the net credit on Property Account is £550. This method of treating the rents will be found to simplify the cost records, and also secure uniformity in the accounts.

Creditors.—

Turning to the Liabilities' side of the Balance Sheet, it will be observed that the creditors amount to £731 14s. 3d. The Barley Accounts include some consignments of foreign barley which have arrived a short time prior to stocktaking. The other outstandings do not call for special remark.

Capital.—

No particulars of the partners' capital are given, as this is no part of the subject under consideration. It may be pointed out, however, that as the balance at the bank will allow of the profit earned being withdrawn from the business, this course will be pursued, it being considered that a permanent capitalisation of about £15,000 is commensurate with the requirements of the business.

PROFIT AND LOSS ACCOUNT.

Trading Account.—

The balance from Trading Account of £1,164 5s. represents the profit from the malting business proper. The remaining credits to this account, and the charges placed against the same, represent in the former further sources of income, and in the case of the latter a distribution or payment out of profits earned.

Sack Hire.—

The firm lets out its sacks to traders and customers as occasion requires, and the receipts are in respect of these transactions.

The amount written off for depreciation of sacks is all charged to this account, it not being considered practicable or necessary to apportion the depreciation as between the ordinary trading and hiring.

Estate Account.—

The method of treating the Rents Receivable in respect of the freehold property, and the outgoings arising thereon, are described under the head of Freehold Kilns.

Profits Insurance.—

The charge in this case includes a provision for loss of rent (or interest on capital), salaries of permanent staff, and net profits (following a fire), and the cover being a general one the expense

may not be charged against the Trading, and therefore falls as a direct charge to Profit and Loss Account. The item of £6 15s. charged is made up, say, as follows:—

Permanent Staff	£500	
Rents, or Interest on Capital in Buildings	700	
Net Profits	1,500	
	£2,700	
At 5/6 per cent.		£6 15 0

Income-tax.—

The payment in respect of Schedule D, Income-tax, should be referred to for several reasons. The Schedule A assessment would fall to be charged against the Rates Account in the first instance, but as this is deductible from the landlord's rent it is charged in the Estate Account and the rent being fully charged against the kilns and credited to that account.

Income-tax being distinctly a payment out of profits, and not an expense of the business, forms no part of the general charges necessary to be covered in the costings. It may be useful, how- is charged in the Estate Account and the rent fully charged against the kilns and credited to that account.

The are as follow:—

ASSESSMENT 1905-6.

		£	s	d
1902—Account, after adjustment		1,290	0	0
1903 ,, ,, ,, ...		1,010	0	0
1904 ,, ,, ,, ...		1,325	10	0
		3)3,625	10	0
		1,208	10	0
Deduct Schedule A. Assessment:—				
Annual Value	£504 0 0			
Less one-sixth	84 0 0			
		420	0	0
		788	10	0
Less Wear and Tear, 7½ per cent. allowed by District Commissioners		38	0	0
		750	10	0

At 1s. .. £37 10s. 6d.

TRADING ACCOUNT.

It will have been noticed that the usual order and precedence of a treatise of this kind is not being observed. The more usual method is to commence with the business in its initial stages, tracing the barleys into the warehouses, through the steeping and malting processes, and including in the text illustrations intended to show the working of the business, and the relation of the technical or factory accounts with the commercial books.

The primary object in this case being to deal with the costings only, and the space allotted to each section of the book obviously limited, it has been thought better to provide a complete set of accounts at the outset, and to give a clear explanation as to the general principles underlying their preparation, the bearing upon the costings of the form of the Annual Accounts being also explained. Having done this, it will be less difficult to set out the illustrations, forms, and costings in a reasonable compass. As will be seen, these may then be shown in a very few pages, as much of the otherwise necessary explanations have been covered under the general accounts.

Sales.—

The Trading Account has now been reached, and the Sales Account may be taken as the first for consideration.

The Sales Day Book should be a columnar one, divided in accordance with the number of maltings it is intended to keep separate and distinct. It should be ruled as follows:—

MALT SALES DAY BOOK.

Date	Outward Docket No.	Name	Weight		Rate per Qr.	No. of Sacks	Amount	Led. Folio	Kiln A									Kiln B				
									English					Foreign				Foreign				
			Qrs.	Bus.			£ s d		Qrs.	Bus.	£	s	d	Qrs.	Bus.	£	s d	Qrs.	Bus.	£	s	d

NOTE.—The Weight and Money columns would be ruled in different coloured inks—say, Weight in blue, Values in red.

A separate Sales Day Book would be kept for the screenings and culms.

There are no special features connected with this book, and the following might be taken as a specimen ruling :—

SUNDRIES SALES DAY BOOK.

Date	Outward Docket No.	Name	Weight		Rate per Cwt.	No. of Sacks	Amount	Ledger Folio	Kiln A						Kiln B					
									Screenings			Culms			Screenings			Culms		
			Cwts.	Qrs.			£ s d		Qrs.	Bus.	£ s d	Cwts.	Qrs.	£ s d	Qrs.	Bus.	£ s d	Cwts.	Qrs.	£ s d

Stocks.—

The Stocks have already been discussed under the Balance Sheet, but it is necessary at this juncture to point out that the stocks of barley appearing in the Barley Accounts (pp. 16 and 17) are not brought into the Trading Account, the consumption, or "steep," of barley only being brought into the Malting Account.

The Trading Account represents the transactions of the commercial or selling side of the business and the finished products only; in this case the stock of malt, culms, screenings are carried by that department, and the balances of each class left unsold show themselves as goods in hand at the commencement and close of the seasons. An abstract of the balances on the Stocks Ledger, described later, as at the date of stocktaking provides the particulars and total stocks for the Trading Account.

Malt.—

The malts transferred from the Maltings to the Trading Account always pass at actual cost price, this being arrived at from the records of the respective steeps, as will be seen from the Steep Ledger.

As it is important to distinguish between the results from working English and foreign barleys, all the books, forms, and accounts constituting the scheme of costings show the two classes separately, and the Annual Accounts of the Kilns summarising these results afford a comparison for the whole season.

Culms.—

The by-product known as combings, or culms, is credited to the Malting Account—in the first place, to the account or costing of the particular steep out of which it arises—and debited to the

Trading Department at an agreed price. In the present accounts culms always pass at a uniform inter-departmental price of £3 per ton. This average price simplifies the costing work, and any margin above this price realised on the sales falls to the credit of the Trading Account. A by-product must be priced in relation to its selling value, but it is only fair to the Trading Department that some balance of profit should be shown over the price at which it is taken from the Malting Account. The inter-departmental price is fixed on this principle.

Screenings.—

The screenings, or small barley, resulting from the treatment of the barleys by special machinery provided for this industry, are passed on to the Trading or Selling Department in the same manner as the culms, the only difference being that in this case the price agreed upon is credited to the Barley Account, the result being to slightly increase the average price per quarter of the total steep, the credit in respect of screenings being less than the original purchase-price.

For the purposes of the present accounts the screenings of English barley are taken at an inter-departmental price of 20s. per quarter, and those of foreign barleys at 15s. per quarter, these prices representing averages taken over a period of years.

Delivery Expenses.—

The carting and carriage charged under this heading are mainly payments to railway companies and other public carriers, but there is also included a proportion of the General Account kept for the Horsekeep and Stable Expenses of the business.

The monthly accounts of the railway and canal companies are dissected as between English and Foreign barleys inwards, and summarised thus:—

LONDON & NORTH-WESTERN RAILWAY ACCOUNT

for March 1906. £63 10s. 2d.

Description	Charge to	£ s d	Folio
Foreign Barley	Steep No. 3	10 11 6	
English do.	" " 7	6 13 6	
Do.	" " 10	5 2 2	
Do.	" " 20	7 2 9	
Malt and Culms	Kiln B	10 6 7	
Do. do.	" A	8 3 5	
Coal	" A	5 6 3	
Coke	" B	2 12 6	
Screenings	" A	1 10 3	
Oats	Horsekeep	2 11 3	
Screening Plant	Machinery	3 10 0	
		£63 10 2	

It will be necessary in the case of large consignments inwards to divide the freight or carriage over the steeps in proportion to the number of quarters in each.

With the same object in view the horsekeep and stable expenses of the business are apportioned. It is necessary, however, in this case to estimate an amount as representing the cost value of the time of a man, horse, and wagon per day, and on this basis allocate to the kilns, steeps, &c., the total cartage expense. This should be done monthly in a simple form of Columnar Abstract Book, the Steep, &c., Accounts in the Cost Ledger being debited and the Horsekeep and Stable Expenses Account (which includes Carters' Wages) credited.

Kiln Balances.—

At this point in the Trading Account the balances are struck, all forms of direct expense having been covered. After adding to the credit balances brought down certain cash discounts, already referred to when considering the book debts, and the allowances made by farmers in certain districts on selling their barleys (a trade or market custom), there remains to be set against the total credits the general management expenses.

Management.—

The items of Salaries, Sack Incidentals, and Travelling Expenses call for no special remark, and the Laboratory Expenses are the balance on this account, after debiting direct to the Kiln Accounts fees for any special analysis. The Head Office is not situate at the maltings, and the rent charge represents payments in respect of tenancy of offices in the town and the relative rates and expenses.

Depreciation.—

The method employed in arriving at this expense has been explained under the heading of "Machinery."

KILN ACCOUNTS.

The separate accounts kept for each kiln now require consideration. In this particular case there are only two kilns, each having warehouses adjoining, in which the barley is stored in readiness for the successive steeps, and where a stock of malt is also held in order to be able to supply customers with regularity and according to contract arrangements.

In the case of Kiln A both home and foreign barleys are malted, in order to occupy the malting as nearly as possible all the year round.

Kiln B, the larger of the two, on the other hand, is entirely devoted to foreign barleys, the supplies being drawn from widely divergent parts of the globe.

An inspection of the Barley Account (p. 16) and Malting Account (p. 16) of the Kiln A will show that the home and foreign results, both as regards barley "cost" and malting "cost" are arrived at independently by means of separate accounts.

The cost per quarter of the barley steeped shown in the account (p. 17) is the average cost for the season, the account

being a summary only of the year's operations. The costings of the individual parcels, and the results of the intermediate and successive steeps, are obtained from the cost or kiln records, as will be seen from the illustrations and forms. For example see pp. 59 and 61. The intermediate results are those principally aimed at in the system of cost, as the annual totals and averages are always available under ordinary bookkeeping methods.

The cost price per quarter of the malt produced is, by the same rule, the average cost over the whole season, the steep and kiln records showing the individual results.

The cost price of the "barley to steep," it will be observed, is made up of very few items: Barley plus carriage, minus screenings, and the result is barley to steep at cost.

In determining the cost of production of malt, there are rather more elements entering into the "cost," but even here the costing is a simple one, viz.:—Barley steeped, plus malting expenses (that is, the direct working expenses of the kiln), minus by-product, the result being malt product at cost.

Two further considerations enter into this question—one affecting the barley cost, the other the cost of the production. In ascertaining the cost per quarter of the barley steeped, the surplus or shortage in barley must be reckoned with, and although it is quite conceivable that this extraordinary element might be dealt with as an indirect profit or loss, it is better that this should lie where it falls, decreasing or increasing the cost per quarter.

In the case of the Malting Account, the cost per quarter of the production is cheapened by the increased number of quarters turned out as against the number of quarters placed in steep, this being a natural or "process" increase. A gain of from 3 to 10 per cent. is not unusually looked for, but it is sometimes found that, through exceptional conditions of working, an actual shortage results.

COSTINGS.

Having now fully considered the accounts with which this section of the volume opens it is necessary to pass on to the accounts and bookkeeping required in a business of this kind, in order to show the past results at short intervals, and to forecast, as far as a careful study of the last completed accounts will allow, the trading of the immediate future.

Day-to-day information, weekly and monthly "returns" and "averages" all contribute their quota in this scheme, and the writer, although conscious of the limitations of any system affording profit and loss results at short intervals, believes it to be of the highest importance that such information should be furnished to the management, and a good plan of Cost Accounts designed to meet the particular business and its special requirements cannot fail in accomplishing this purpose.

Cost records of all kinds are brought about primarily by the trader's anxiety to ascertain at frequent periods how his business is going on. He cannot in these days of competition afford to wait for yearly stocktakings and the results shown by the preparation of a Balance Sheet and Profit and Loss Account; which accounts, after all, may not disclose information enabling him to determine the reason and cause of certain unsatisfactory features in these financial statements.

In localising the profits and losses in a malting business it may be assumed that there are at least two important considerations:—

(1) It is necessary to know which classes of barley, and in which steeps and stages, these have proved remunerative or otherwise.

(2) The recording of the information thus gained under a suitable system of Cost Accounts furnishes a safe guide by which to check and determine future calculations in respect of the purchasing and other departmental arrangements.

In the present case it is assumed that the management realising the importance of reliable records on the lines indicated, arranges to institute a system of Cost and Departmental Accounts, and the essential features of the plan employed are as now described:—

Standard.—

It is found to be necessary at the outset to formulate a standard or basis of measurement for testing results, and this is a *sine qua non* in all systems of cost. The capitalisation of the business and the output capacity of the kilns must be directly co-relative.

The capital employed is, say, £15,000, and the partners in the firm supervise the general management of the concern, but do not draw salaries from the business. This being so, they naturally look for a higher percentage of profit on the capital engaged, and place the minimum earnings at an amount equal to 10 per cent. on the capital, or £1,500 per annum.

It is necessary, therefore, that the plan of working the business should be drawn, and the general organisation conducted with this ideal or aim in view.

Having by former experience—or, it may be, by skilful advice—ascertained the "steeping," "flooring," and "drying" capacity of the kilns, each of which processes would have its own plant or floor space proportionable with its requirements, in order to secure the regular and economical working of the whole, a calculation or approximate costing of the ensuing season's total turn-out of malt is made.

The costing is on the following lines, and it will be seen that the unit of measurement in every case is production per quarter. Average prices of barleys bought, "costs per quarter to steep," and expenses based on quarters worked, all have their value as assisting in the determination of the

minimum margin of profit to be reasonably relied upon; but the standard of measurement at length will be found to be the production, in this case the quarter of malt.

ESTIMATED TOTAL MALT COSTING.

SEASON 1904/5. PREPARED OCTOBER 1904.

SALES.—Malt.

Contracts have been entered into for a considerable portion of the trade for the ensuing season, and the total average selling price for the year is therefore more readily estimated.

Estimated average selling price for whole season arrived at thus:—

		£ s d
Contracts, English	2,000 Qrs. at 41/6 ..	4,150 0 0
Open Trade "	574 " " 40/4 ..	1,158 17 6
	2,574 " " 41/3 ..	£5,308 17 6
Contracts, Foreign	5,500 " " 34/- ..	9,350 0 0
Open Trade "	1,576 " " 32/10 ..	2,590 15 0
	7,076 " " 33/9 ..	£11,940 15 0
Total	9,650	£17.249 12 6

The production necessary to supply the foregoing amount of trade is estimated on the following basis:—

	English	Foreign	
STEEP.	Qrs.	Qrs.	
Nominal Steep..	2,400	6,600	
Less ¼ per cent. loss in Barley on weighing out	6	17	
	2,394	6,583	
Add gain on Malting, say 7½ per cent. on steep	180	493	
	2,574	7,076	
SCREENINGS.			
87 Qrs. Screenings at 22/6			95 7 6
734 do. 15/6			568 17 0
			£664 4 6
CULMS.			
75 Tons of Culms (By-product) at 58/-			£217 10 0

ESTIMATED COSTING—*continued.*

PURCHASES.—Barley.

Qrs.		£ s d	£ s d
2,487	English Barley at 31/- (*a*)	3,854 17 0	
87	Screenings, say 3½ per cent.		
2,400	Carriage, say 9d. per qr.	93 5 3	3,948 2 3
3,000	Foreign Barley, ex Smyrna, at 21/9	3,262 10 0	
2,000	do. ex Californa, at 22/3	2,225 0 0	
1,000	do. ex Barcelona, at 22/9	1,137 10 0	
1,334	do. Open Supplies, at 21/7½ ..	1,442 8 0	
7,334	at 22/- (*b*) ..	8,067 8 0	
734	Screenings, say 10 per cent.		
6,600	Freight, Carriage, &c., say 3/4 per qr.	1,222 6 8	9,289 14 8
9,000	Total	..	£13,237 16 11

NOTES.—(*a*) English price 31/-. The above estimated average price of home barley is based on past experience and the tendencies of the market.

(*b*) Foreign price 22/-. The bulk of the season's supplies are already booked and the margin of error in estimating the total average reduced to a minimum.

No adjustment is necessary at this stage for surplus or shortage in weight of barleys, the full purchased weight being costed.

KILN EXPENSES.

	Kiln A	Kiln B	
	£	£	£ s d
Wages	190	460	
Rent, Rates, and Taxes	260	755	
Coal and Carriage	85	240	
Coke and Carriage	116	125	
Gas and Water..	30	80	
Maintenance, Utensils, &c...	28	65	
Laboratory Expenses	10	14	
Insurance	5	12	
	£724	£1,751	
Kiln A	..	..	724 0 0
Kiln B	..	..	1,751 0 0
			£2,475 0 0
Or, on 9,000 quarters the assumed output an average of 5/6.			

ESTIMATED COSTING—*continued.*

SALES EXPENSES.

	Kiln A	Kiln B	£ s d
	£	£	
Horsekeep and Stable Expenses	200		
Carriage and Cartage Outwards	..	85	
Local Office and other direct Selling Expenses	75	160	
	275	£245	
Kiln A	..	..	275 0 0
Kiln B	..	..	245 0 0
			£520 0 0

NOTE.—The Kiln and Sales Expenses shown above are both taken on past experience after reviewing the immediate conditions of trading and making the necessary adjustments.

GENERAL CHARGES.

		£ s d
Salaries		500 0 0
Laboratory Expenses (General)		60 0 0
Sack Incidentals		20 0 0
Travelling Expenses		65 0 0
Head Office Rent and Expenses		155 0 0
		800 0 0
Deduct Cash Discounts received and Allowances on Farmers' Barley	£127 0 0	
Less Amount allowed	60 0 0	
		67 0 0
		733 0 0
Add Depreciation on Machinery not charged direct to Kiln Accounts ..		37 0 0
		770 0 0
INTEREST.		
Bank Interest for Temporary Overdraft		35 0 0
Interest on Capital 5 per cent. on £15,000		750 0 0
		£785 0 0

ESTIMATED COSTING—*continued.*

SUMMARY.

Purchases.	£ s d	*Sales.*	£ s d
Barley and Carriage.. ..	13,237 16 11	Malt	17,249 12 6
Kiln Expenses	2,475 0 0	Screenings	664 4 6
Sales "	520 0 0	Culms	217 10 0
General Charges	770 0 0		
Balance down..	1,128 10 1		
	£18,131 7 0		£18,131 7 0
Bank Interest..	35 0 0	Balance down	1,128 10 1
Special Charges as per last Profit and Loss Account, estimated	59 0 0	Net Rents as per last year's Accounts	530 0 0
Income Tax, estimated ..	40 0 0	Sundry Receipts	10 0 0
Balance, or Profit down ..	1,534 10 1		
	£1,668 10 1		£1,668 10 1
Return on Capital employed representing :— Interest at 5 per cent. on £15,000	750 0 0	Profit down	1,534 10 1
(*a*) Profit, about 5¼ per cent. on £15,000	784 10 1		
	£1,534 10 1		£1,534 10 1

(*a*) A net profit of about 5 per cent. is not regarded by the firm as satisfactory, but they do not see any prospect in the coming year of earning a higher rate, and have estimated accordingly.

The actual result at the end of the season 1904-5 was found to be a profit of £1,584 14s. 6d., and the following tables show the reconciliation of the estimated with the actual quantities and amounts :—

RECONCILIATION 1904-5.

Estimate.			SALES.	*Actual.*		
Qrs.	Rate	£ s d		Qrs.	Rate	£ s d
2,574	41/3	5,308 17 6	English Malt	2,250	41/6	4,668 15 0
7,076	33/9	11,940 15 0	Foreign do.	750	35/-	1,312 10 0
..	..	..	Do. do.	7,405	33/6	12,403 7 6
755	..	1,135 0 0	Balance..	..	..	..
10,405	..	£18,384 12 6		10,405	..	£18,384 12 6

SALES—SCREENINGS.

Qrs.	Rate	£ s d		Qrs.	Rate	£ s d
87	22/6	95 7 6	Screenings	100	22/6	112 10 0
734	15/6	568 17 0	Do.	570	15/6	441 11 0
..	..	..	Balance	151	..	110 3 6
821	..	£664 4 6		821	..	£664 4 6

Sales—Culms.

Tons	Rate	£	s	d		Tons	Rate	£	s	d
75	55/-	217	10	0	Culms	30	66/-	99	0	0
..	..	..			Do.	60	65/-	195	0	0
15	..	76	10	0	Balance..	..	..	..		
90	..	£294	0	0		90	..	£294	0	0

Purchases and Carriage.

Qrs.	Rate	£	s	d		Qrs.	Rate	£	s	d
2,487	31/-	3,854	17	0	English Barley ..	2,020	30/6	3,080	10	0
..	9d.	93	5	3	Do. (carriage) ..	..	9½	79	19	2
7,334	22/-	8,067	8	0	Foreign	7,500	22/-	8,250	0	0
..	..	1,222	6	8	Do. (carriage) ..	..	3/4	1,250	0	0
..	..	..			Foreign..	800	24/-	960	0	0
..	..	..			Do. (carriage) ..	..	3/-	120	0	0
499	..	502	12	3	Balance	..	..	..		
10,320	..	£13,740	9	2		10,320	..	£13,740	9	2

Kiln Expenses.

Estimate. A			*Estimate.* B				*Actual.* A			*Actual.* B		
£	s	d	£	s	d		£	s	d	£	s	d
190	0	0	460	0	0	Wages	180	0	0	450	0	0
260	0	0	755	0	0	Rent, Rates, &c.	263	0	0	760	0	0
85	0	0	240	0	0	Coal and Carriage ..	79	0	0	250	0	0
116	0	0	125	0	0	Coke " " ..	113	0	0	123	0	0
30	0	0	80	0	0	Gas and Water	22	0	0	85	0	0
28	0	0	65	0	0	Maintenance, &c.	25	0	0	56	0	0
10	0	0	14	0	0	Laboratory	12	0	0	25	0	0
5	0	0	12	0	0	Insurance	5	0	0	11	0	0
£724	0	0	£1,751	0	0		£693	0	0	£1,760	0	0
			724	0	0	Kiln A	..			698	15	9
			1,751	0	0	" B	..			1,759	10	0
						Balance	..			16	14	3
			£2,475	0	0					£2,475	0	0

Selling Expenses.

A			B				A			B		
£	s	d	£	s	d		£	s	d	£	s	d
200	0	0	..			Horsekeep and Stable Expenses	296	0	0	..		
..			85	0	0	Carriage and Cartage Outwards	..			85	0	0
75	0	0	160	0	0	Local Office and other direct Selling Expenses	81	0	0	150	0	0
£275	0	0	£245	0	0		£377	0	0	£235	0	0
			275	0	0	Kiln A	..			377	0	0
			245	0	0	" B	..			235	0	0
			92	0	0	Balance	..			..		
			£612	0	0					£612	0	0

Estimate. £ s d	£ s d	GENERAL CHARGES.	£ s d	Actual. £ s d
500 0 0	..	Salaries	..	500 0 0
60 0 0	..	Laboratory (general) ..	..	53 7 6
20 0 0	..	Sack Incidentals	..	15 6 0
65 0 0	..	Travelling	..	70 6 9
155 0 0	..	Head Office Expenses ..	..	161 7 11
800 0 0				800 8 2
		Less—		
	127 0 0	Cash Discounts .. *Cr.*	163 4 6	
67 0 0	60 0 0	Do. .. *Dr.*	75 1 3	88 3 3
733 0 0				712 4 11
		Add—		
37 0 0	..	Depreciation	..	37 10 0
770 0 0				749 14 11
		Balance	..	20 5 1
£770 0 0				£770 0 0

SUMMARY OF VARIATIONS FROM ESTIMATE.

	£ s d	£ s d
SALES :—		
Malt	..	1,135 0 0
Do. (ex-Stock)	1,270 2 0	
Screenings	110 3 6	
Do. (ex-Stock)	30 0 0	
Culms	..	76 10 0
Do. (ex-Stock)	47 5 0	
PURCHASES :—		
Barley	502 12 3	
Do. (to Stock)	..	839 8 4
Kiln Expenses	..	16 14 3
Selling Expenses..	92 0 0	
General Charges..	.	20 5 1
	2,052 2 9	2,087 17 8
Balance down	35 14 11	
	£2,087 17 8	£2,087 17 8
Balance down	..	35 14 11
Net Rents	..	20 0 0
Sundry Receipts	5 5 0	
Bank Interest	2 10 0	
Special Charges	0 5 0	
Income-tax	..	2 9 6
Balance, being Net Credit Balance in excess of Estimate (*a*)	50 4 5	
	£58 4 5	£58 4 5
(*a*) Net Profit as per Accounts	..	1,584 14 6
Do. do. Estimated Costing	..	1,534 10 1
		£50 4 5

The above Reconciliation Summary shows that more malt was sold than the actual kiln output for the season, the stocks being considerably reduced. Also that the screenings and culms were not closely estimated. The purchases of barley were also heavier, but, these being carried forward to next season at cost price, the estimated profit is not affected.

It should be noted at this point that increases or decreases in the stocks of malts in hand at the date of making up the accounts, whilst they do affect profits as between periods, have no actual bearing on the profits forecasted by the estimates. The full output of the business, assuming the kilns working at their fullest capacity, is costed, and the variation in sales one year with another simply means a postponement or acceleration in the realisation of the estimated profit on the full turnover, subject, of course, to variations in selling prices.

It is not enough, however, to have prepared the estimated Cost Sheet at the beginning of the year. A close watch must be kept on the average buying and selling prices obtaining during the currency of the season, and in order to effect this the information afforded by the Inward Barley records and the Outward Malt Accounts must be focussed from time to time and submitted to the management. The data thus compiled enables it to be seen whether there are any wide variations from the original estimate or standard set up, and if these are compiled at short intervals it will allow of time for efforts being made to redress the balance, or average, before stocktaking.

Weekly Returns.—

The management have decided that their minimum requirements in this direction are:—

(1) Weekly Return of Barleys Purchased and average price, also average price from last stocktaking to date.

(2) Average cost per quarter of the Railway, &c., Carriage Inwards, including firm's own Horsekeep Account.

(3) Weekly Return of Malt Sold and average price, also average price to date.

(4) Average cost per quarter of the Delivery charges, including Horsekeep Account.

(5) Costing of each individual steep of barley.

(6) Monthly Return of Stocks on hand as taken from books.

(7) Chemist's Analysis and Report on the malts, temperature readings, &c.

These returns would be required weekly in the season, but for the purposes of the illustration let them be assumed as monthly periods.

Office Books: Bought Ledger.—

It is necessary to refer to the general counting-house books for a moment at this stage, and to mention that no Bought Ledger Accounts are kept with the farmers. An account will be opened with each broker or factor supplying foreign grain: payments are probably made on account as the cargo is discharged, and it is necessary to have a clear record of the settlement. There will be interest and special charges, adjustments in weight, demurrage, &c., and these may have to be dealt with through the Office Journal.

In the case of the farmers' barley, however, the cheque payment is posted direct from the Cash Book to the Barley Purchases Journal. No invoices are received from the farmers, and the system of check upon the purchases is as follows:—

Market Supplies.—

On the buyers returning from the weekly markets, they write up from their pocket-book memoranda full particulars of their purchases into a Market Supplies Book, which may be ruled as under:—

MARKET SUPPLIES BOOK.

Date of Purchase	Market	Farmer's Name and Address	Approximate Quantity		Rate per Qr.	Kiln Received Docket	Actual Quantity		Barley Purchases Bk. fo.	Cheque drawn		Remarks	Kilns Receiving					
			Qrs.	Bus.			Qrs.	Bus.		Date	No.		A English	A Foreign	B English	B Foreign	C English	C Foreign

The Market Supplies Book is not used as a book of account, and the values are not shown. A reference to the Barley Purchases Book is given, as it is from this record of supplies that the Purchases Book is written up, there being no invoices received.

Foreign supplies are also entered in this book—separate section—in order to have a uniform record of purchases, as it is not well to have a redundancy of books. The object is served if the total quarters of all classes of barley purchased agree with the gross total of the barleys hypothecated to the kilns under the quarters' columns on the right-hand side of the book.

The office issues an order or docket, consecutively numbered, for each parcel bought, and this is the instruction to the kiln foreman to receive the barley in question. The order is for an approximate number of quarters, as the weight has not then been accurately ascertained.

It will be convenient to give a specimen of the Kiln Received Order at this point, as under:—

KILN RECEIVED ORDER.

No. *103.*

Retained in Book.

Date.....

Name .....

Kiln .....

Approximate Weight.....

Memo. as to Sacks :

Blank space to which Receipt is affixed after certification.

No. *103.*

Retained by Foreman of Kiln.

Date.....

Name.....

Qrs..... Bush.....

Reference to Barley Sheet } .....

Whose Sacks :

Firm's.....

Owner's.....

No. *103.*

Town.....

October 10th 1905.

Mr.....

DELIVER to our.....Kiln

.....quarters ex.....

Sacks : Firm's.....

Owner's .....

Firm's Name.....

RECEIVED.....quarters .....bushels.

.....*Foreman.*

Details of Weighings	
Qrs.	Bush.

The barley is carefully measured by means of an automatic weighing machine, and the true weight inserted and certified on that part of the docket which is returned to the office. This part acts as an "order to pay" to the cashier, and is "referenced" to the Barley Purchases Journal. One section of the docket is retained by the foreman, and forms the basis for writing up his periodical returns for the counting-house. In this case, a Weekly Barleys-In Sheet. That section which is returned to the office is referenced off to the Market Book, and no cheque may be drawn for barley bought until this certified docket has been received from the foreman, and the corrected details entered in the Market Book.

It is well to employ a special form of cheque for all barley purchases, and as this has its advantages in vouching the grain supplies its form is now given. A specimen of the Barley Purchases Journal is also submitted at this point.

No.....

COUNTERFOIL.

.....1905.

PAY to.....

.....

Particulars:

100 Qrs. of Barley at 30/-

£150.

Kiln Received Order.....

Sacks, No.....

(Owner or Farmers)

No.....

Town.....

.....1905.

Messrs.....

have pleasure in enclosing herewith cheque in payment of account,

£150 0 0.

The signature to the receipt at foot of cheque is the only acknowledgment required, but in addition to the completion of the Receipt the cheque must be endorsed by the Payee.

No. of Cheque.....

Firm's Name.....

Town.....

.....1905.

TO THE CITIES & COUNTIES BANK, LIM.

PAY to.....

the sum named below on the Receipt being presented through a Banker, duly stamped, signed, and dated.

.....

Drawer's Signature.

(*a*) RECEIVED from the (name of firm) the sum of One Hundred and Fifty pounds as per particulars furnished.

£150 0 0.

Signature.....

Date.....

1d.

.....

Stamp.

.....

.....

N.B.—An alternative form is that giving the receipt (*a*) on the back of the cheque, the Payee's signature thus operating as an endorsement for Banker's purposes.

BARLEY PURCHASES JOURNAL.

Date	Kiln Received Docket	Supplier's Name	Quantity		Rate	Dr. C.B. folio	Amount	Cr. Market Sup'lies Bk. fo.	Kiln A						Kiln B					
									English			Foreign			English			Foreign		
			Qrs.	Bus.			£ s d		Qrs	Bus.	£ s d	Qrs.	Bus.	£ s d	Qrs.	Bus.	£ s d	Qrs.	Bus.	£ s d

Sales—Culms.

Tons	Rate	£	s	d		Tons	Rate	£	s	d
75	58/-	217	10	0	Culms	30	66/-	99	0	0
..	..	..			Do.	60	65/-	195	0	0
15	..	76	10	0	Balance..	..	..	..		
90	..	£294	0	0		90	..	£294	0	0

Purchases and Carriage.

Qrs.	Rate	£	s	d		Qrs.	Rate	£	s	d
2,487	31/-	3,854	17	0	English Barley ..	2,020	30/6	3,080	10	0
..	9d.	93	5	3	Do. (carriage) ..	..	9½	79	19	2
7,334	22/-	8,067	8	0	Foreign	7,500	22/-	8,250	0	0
..	..	1,222	6	8	Do. (carriage) ..	..	3/4	1,250	0	0
..	..	..			Foreign..	800	24/-	960	0	0
..	..	..			Do. (carriage) ..	..	3/-	120	0	0
499	..	502	12	3	Balance	..	..	..		
10,320	..	£13,740	9	2		10,320	..	£13,740	9	2

Kiln Expenses.

Estimate. A			*Estimate.* B				*Actual.* A			*Actual.* B		
£	s	d	£	s	d		£	s	d	£	s	d
190	0	0	460	0	0	Wages	180	0	0	450	0	0
260	0	0	755	0	0	Rent, Rates, &c.	263	0	0	760	0	0
85	0	0	240	0	0	Coal and Carriage ..	79	0	0	250	0	0
116	0	0	125	0	0	Coke " " ..	113	0	0	123	0	0
30	0	0	80	0	0	Gas and Water	22	0	0	85	0	0
28	0	0	65	0	0	Maintenance, &c.	25	0	0	56	0	0
10	0	0	14	0	0	Laboratory	12	0	0	25	0	0
5	0	0	12	0	0	Insurance	5	0	0	11	0	0
£724	0	0	£1,751	0	0		£693	0	0	£1,760	0	0
			724	0	0	Kiln A	..			698	15	9
			1,751	0	0	" B	..			1,759	10	0
						Balance	..			16	14	3
			£2,475	0	0					£2,475	0	0

Selling Expenses.

A			B				A			B		
£	s	d	£	s	d		£	s	d	£	s	d
200	0	0	..			Horsekeep and Stable Expenses	296	0	0	..		
..			85	0	0	Carriage and Cartage Outwards	..			85	0	0
75	0	0	160	0	0	Local Office and other direct Selling Expenses	81	0	0	150	0	0
£275	0	0	£245	0	0		£377	0	0	£235	0	0
			275	0	0	Kiln A	..			377	0	0
			245	0	0	" B	..			235	0	0
			92	0	0	Balance	..			..		
			£612	0	0					£612	0	0

Estimate. £ s d	£ s d	GENERAL CHARGES.	£ s d	*Actual.* £ s d
500 0 0	..	Salaries	..	500 0 0
60 0 0	..	Laboratory (general) ..	..	53 7 6
20 0 0	..	Sack Incidentals	..	15 6 0
65 0 0	..	Travelling	..	70 6 9
155 0 0	..	Head Office Expenses ..	..	161 7 11
800 0 0				800 8 2
		Less—		
	127 0 0	Cash Discounts .. *Cr.*	163 4 6	
67 0 0	60 0 0	Do. .. *Dr.*	75 1 3	88 3 3
733 0 0				712 4 11
		Add—		
37 0 0	..	Depreciation	..	37 10 0
770 0 0				749 14 11
		Balance	..	20 5 1
£770 0 0				£770 0 0

SUMMARY OF VARIATIONS FROM ESTIMATE.

	£ s d	£ s d
SALES :—		
Malt	..	1,135 0 0
Do. (ex-Stock)	1,270 2 0	
Screenings	110 3 6	
Do. (ex-Stock)	30 0 0	
Culms	..	76 10 0
Do. (ex-Stock)	47 5 0	
PURCHASES :—		
Barley	502 12 3	
Do. (to Stock)	..	839 8 4
Kiln Expenses	..	16 14 3
Selling Expenses..	92 0 0	
General Charges..	.	20 5 1
	2,052 2 9	2,087 17 8
Balance down	35 14 11	
	£2,087 17 8	£2,087 17 8
Balance down	..	35 14 11
Net Rents	..	20 0 0
Sundry Receipts	5 5 0	
Bank Interest	2 10 0	
Special Charges	0 5 0	
Income-tax	..	2 9 6
Balance, being Net Credit Balance in excess of Estimate (*a*)	50 4 5	
	£58 4 5	£58 4 5
(*a*) Net Profit as per Accounts	..	1,584 14 6
Do. do. Estimated Costing	..	1,534 10 1
		£50 4 5

It should be pointed out perhaps that these Weekly Sheets prepared by the foreman are written up from the dockets at the time, and when the last entry is made on closing down for the week they are posted to the office for Monday morning. At the foot of each sheet is a record of all working supplies—such as Coal, Coke, Utensils, &c., received.

The office staff compile the periodical returns from these Weekly Sheets, which are bound together in book form, being numbered consecutively. The foreman retains a carbon copy, the sheets being in manifold book form.

The Head Office has now, it will have been observed, weekly information afforded as to the barleys actually received into the maltings, as distinguished from the barleys bought, and, on the other hand, correct details of all malts delivered.

The office requires, however, further information from the kiln foremen, in order to keep track of the movements of the barley in the warehouses and kilns, and for this purpose the office must first of all know exactly the storing accommodation and steeping capacity and general construction of the kilns and warehouses. This information is obtained from a plan of the buildings. In the case of a newly-constructed kiln the architect's plan would afford particulars.

The foreman of a malting, in addition to his Weekly Return of Barleys-In and Malts-Out—each of which, as will be seen from the specimen rulings following, indicate the rooms, floors, garners, bins, &c., in which the goods have been stored—has to prepare a Weekly Return of all Transfers of Barley or Malt. Barley will be removed from Warehouse D (Room 3, Bin 10) to Kiln A (Floor 2) for steeping purposes, or malt may be removed from one warehouse to another for convenience of ultimate despatch.

The foremen's Weekly Returns are now shown:—

KILN.....

WEEKLY RETURN OF BARLEYS, &c, INWARDS.—No. 10.

Week ending.....1905.

Date	Name	Docket No.	Quantity		Remarks as to Sacks, Condition, &c.	Where Stored *	Office Posting Folio
			Qrs.	Bus.			
I. Barleys:—							
II. Coal and other Working Supplies received:—							
						Foreman's Signature.....	

* NOTE.—Warehouses, Rooms, Bins, Kiln Drying, Steeps, &c.

KILN.....

WEEKLY RETURN OF MALTS, &c., OUTWARDS.—No. 15.

Week ending.....1905.

Date	Name	Docket No.	Quantity		Remarks	Withdrawn from							Office Posting Folio
			Qrs.	Bus.									
I. Malts:—													
II. Sundries:—													
	Culms despatched (details):—												
	Screenings despatched (details):—												
						Foreman's Signature							

KILN.....

WEEKLY RETURN OF TRANSFERS. Week ending.....1905.

Date	Description	From	Cr. Office folio	Quantity Qrs.	Quantity Bus.	Dr. Office folio	To	Remarks
Nov. 7	Barley	Steep No. 10	..	100	6	..	Malting M, Room C, Bin 9 ..	
8	Malt	Malting B, Steep No. 11 .. .	..	50	..	..	Warehouse D, Room 6	
9	Screenings ..	Warehouse F, Room 9 ..	..	35	..	..	Midland Railway Warehouse ..	
							Foreman's Signature.....	.....

N.B.—The posting folio columns for office use only.

Referring once more to the stocks it will now be seen that the office information is sufficient to enable correct Stock Accounts to be kept. The Stocks Ledger will be divided into sections, so as to allow of ready reference; for example, the section devoted to Warehouse M will contain the rooms, floors, bins, &c., of that warehouse, and the malt stores in like manner. Upon the Weekly Sheets of Supplies and Deliveries being posted up to date the "Book Stocks" will always be the total of the quantities shown as the balances on the respective accounts. On careful measurement taking place at the annual stocktaking slight differences will arise, and these are then adjusted, and the actual stocks on hand constitute not only the figures for the Balance Sheet, but also the opening balances for the Stock Ledger Accounts for the new season.

The Stocks Ledger will include the barleys, malts, culms, &c., in suitable divisions, as has been pointed out, and will also provide the records of the individual "steeps," each steep being shown on a separate page. The Ledger should be ruled on a fairly general basis capable of adaptation to the circumstances of the particular account, and should be of a convenient size, pages being provided to last one season only. In the event of it being decided to use a Ledger that will provide space for several seasons, in order to have greater continuity, then the costings of steeps should be on subsidiary Cards or Sheets, but part of the Ledger in principle. The Ledger may be ruled as follows:—

STOCKS LEDGER.

BARLEY (OR MALT). (Description). ROOM C. BIN 31.

Dr. IN. OUT. *Cr.*

Date	Docket No.	Name	Particulars	Qrs.	Bus.	Rate	Amount	Date	Docket No.	Particulars	Qrs.	Bus	Rate	Amount
							£ s d							£ s d

The following specimen ruling shows a page in the Stocks Ledger, devoted to Steep No. 30 of the Kiln A. This page will contain when completed a miniature Malting Account on the lines of the season's Malting Account, fully set out at the beginning of the section on Malting Accounts, with this exception, that no working expenses are brought into the "Steep" Accounts. The fluctuations in the expenses are easily measurable from the counting-house books, and may be readily dealt with as deductions from the gross profit on the malting.

KILN A. STEEP No. 30. Folio.....

.....QUARTERS ENGLISH BARLEY. Floor No.....

Date	Sheet No.	Particulars	Quarters	Price	£ s d	Date	Sheet No.	Particulars	Quarters	Price	£ s d

Office Returns.—

The information necessary to the preparation of the Weekly Returns being now fully available, the office staff compile the following, and it will be seen that these are for the week ending March 27th 1905, and the cumulative figures embrace a period of twenty-five weeks.

In the illustration given a few parcels only are assumed as having been dealt with, but in actual practice the purchases and sales of one week might represent many parcels inwards and outwards. This, however, does not affect the principle.

The Weekly Summary Sheet, accumulating all financial data, may be prepared to show the actual result to date in profit and loss figures, or it may be drawn up to show simply the salient facts as compared with the costings prepared at the beginning of the season. The essential points are:—

Gross margin as between barley purchased and malt sold.

Screenings.—Percentage on purchases, as any increase over the estimate raises the cost of the barley steeped.

Gain in Malt.—Percentage to date.

Culms.—Comparison in percentages on tonnage production.

Kiln Expenses per quarter.

Delivery Expenses per quarter.

It will be found that with this information properly focussed a good check on the original standard or costing is ensured.

Pro formâ Weekly Returns and Summaries as prepared by the office are now submitted.

WEEKLY RETURN OF BARLEYS BOUGHT.

Week ending March 27th 1905.

English					Foreign				
Current Week		Total to Date		Standard	Current Week		Total to Date		Standard
Qrs.	Rate	Qrs.	Av'rage		Qrs.	Rate	Qrs.	Av'rage	
		1,005	31/6	31/-	..		3,100	22/3	22/-
100	31/-				350	21/9			
50	32/-				200	22/-			
60	31/6				100	22/3			
30	29/9				100	21/6			
20	30/-								
60	31/3								
320		1,325			750		3,850		
	31/1·40	..	31/4·32	31/-	..		..	22/2·06	22/-

WEEKLY RETURN OF MALT SOLD.

Week ending March 27th 1905.

English					Foreign				
Current Week		Total to Date		Standard	Current Week		Total to Date		Standard
Qrs.	Rate	Qrs.	Av'rage		Qrs.	Rate	Qrs.	Av'rage	
		900	41/9	41/3			3,700	34/-	33/9
50	41/6				100	33/6			
70	41/3				50	33/9			
50	42/-				50	33/3			
80	42/3				100	34/3			
20	41/4				200	34/-			
30	41/-				200	34/6			
300		1,200			700		4,400		
	41/7·97	..	41/8·74	41/3	..		..	34/0·06	33/9

SUMMARY FOR 25 WEEKS TO DATE.

	English		Foreign	
	Actual	Standard	Actual	Standard
Barley Purchases to date	31/4·32	31/-	22/2·06	22/-
Malt Sales " "	41/8 74	41/3	34/0·06	33/9
Gross Margin	10/4·42	10/3	11/10	11/9

Estimate.		Actual.	
		Current Week	Average to Date
22/-	Screenings, English	22/-	21/9
15/-	Do. Foreign	15/-	15/3
60/-	Culms	65/-	60/-
5 per cent.	Gain in Malt, English	..	$4\frac{3}{4}$ per cent.
$8\frac{1}{2}$ "	Do. Foreign	..	$10\frac{1}{2}$ "
5/6	Kiln Expenses	..	5/4
1/6	Delivery Expenses	..	1/7

Thus has it been shown that where there is a ready means of measuring the output, as in this case, the quarter of malt produced, a very simple and complete system of Cost Accounts is not only practicable, but easily put into operation without much specialised clerical labour.

SECTION II.

THE ACCOUNTS AND COSTINGS OF AN ENGINEERING BUSINESS.

MANUFACTURING MACHINES TO STANDARD PATTERNS.

STANDARDISED PRODUCTION.

As in the case of the other sections dealing with the industries which have been grouped under the general title of "Single Costs," it will perhaps be well to introduce the more technical features and details of the present business, and the system of costing advocated, by first considering the *pro formâ* Balance Sheet and Accounts with which the section opens.

These are as follow:—

(1) Balance Sheet at 31st December 1905.

(2) Manufacturing Account for year ending at this date, showing Works Output at "Shop Cost."

(3) Trading Account for same period, showing, in addition to the financial results of the business done, the agreement of the Finished Stock, results of the Repairing Shops, &c.

(4) Profit and Loss Account for same period, exhibiting the net available balance after providing Interest on Capital and Special Reserves.

BALANCE SHEET at 31st December 1905.

Liabilities.	£ s d	£ s d
CREDITORS	..	3,200 0 0
RESERVE FOR RENEWAL AND IMPROVEMENT OF MACHINERY AND PLANT:—		
Amount at January 1st 1905	1,000 0 0	
Deduct Book Value of obsolete Plant sold during year, less scrap price	450 0 0	
	550 0 0	
Add further amount for obsolescence set aside out of profits for year ..	240 0 0	
		790 0 0
PROPRIETORS' CAPITAL:—		
Amount at January 1st 1905	24,200 0 0	
Add Interest for year at 5 per cent. £1,210 0 0		
Net Profit for year 2,150 0 0		
	3,360 0 0	
		27,560 0 0
		£31,550 0 0

Assets.	£ s d	£ s d
FREEHOLD LAND AND WORKS	..	5,000 0 0
LEASEHOLD PROPERTY (Repairing Works) cost	1,000 0 0	
Less Amortisation Account	100 0 0	
		900 0 0
MACHINERY AND PLANT:—		
Balance at 1st January 1905	5,975 0 0	
Less Obsolete Plant transferred to Reserve Account £450 0 0		
Depreciation 250 0 0		
	700 0 0	
	5,275 0 0	
Add New Plant installed	600 0 0	
		5,875 0 0
Office Furniture, less Depreciation 5 p.c...	..	285 0 0
STOCK-IN-TRADE, as per Annual Survey:—		
Finished Stock, at cost (Trading Account)	4,150 0 0	
Work in Progress, at cost (Manufacturing Account)	2,500 0 0	
Raw Material and Stores (Manufacturing Account)	1,250 0 0	
Accessories, as purchased	150 0 0	
Repairing Materials, as purchased ..	100 0 0	
		8,150 0 0
LOOSE TOOLS, as per Annual Survey ..	1,500 0 0	
PATTERNS AND DRAWINGS, as per Annual Survey..	1,000 0 0	
		2,500 0 0
BOOK DEBTS:—		
Trade Accounts, net	4,300 0 0	
Less Bad Debt Reserve..	500 0 0	
	3,800 0 0	
Other Debtors and Unexpired Values..	500 0 0	
		4,300 0 0
CASH at Bank and in hand	..	2,000 0 0
PATENTS, PATENT RIGHTS, & LICENCES, 1st January 1905	1,000 0 0	
Less Proportion written off (average period to run)	100 0 0	
		900 0 0
GOODWILL, Purchase price	..	1,640 0 0
		£31,550 0 0

Accounts for Year ending 31st December 1905.

I.—MANUFACTURING ACCOUNT.

	£ s d	£ s d
To Work in hand at 1st January 1905 ..	..	1,800 0 0
" Material :—		
Purchases charged direct to Order Nos.	1,043 0 0	
Purchases debited to Stores £331 0 0		
Withdrawn from Stores :—		
Stock, 1st Jan. 1905 .. ..£1,376 0 0		
Stock, 31st Dec. 1905 .. .. 1,250 0 0		
126 0 0		
	457 0 0	
		1,500 0 0
" Labour	..	3,000 0 0
" Shop Expenses :—		
Staff Wages: Stores, Time, Gate, &c.	245 0 0	
Foremen's Wages	400 0 0	
Lighting and Heating	80 0 0	
Rent (Interest on Capital)	200 0 0	
Rates	60 0 0	
Insurance: Fire and Workmen's Compensation	50 0 0	
Loose Tools Consumed	200 0 0	
Patterns, Balance	190 0 0	
Maintenance of Plant	325 0 0	
Depreciation do.	250 0 0	
Works Superintendent..	550 0 0	
		2,550 0 0
		£8,850 0 0

		£ s d	£ s d
By Works Output at Shop Cost :—			
	Machines		
Model A	180	15 2 9	2,725 0 0
" B	200	13 10 0	2,700 0 0
" C	50	10 0 0	500 0 0
" D	50	8 10 0	425 0 0
	480	£13 4 7	6,350 0 0
" Work in hand at Shop Cost, 31st December 1905		..	2,500 0 0
			£8,850 0 0

Accounts for Year ending 31st December 1905 (*continued*).

II.—TRADING ACCOUNT.

	No. of Machines	Average Price £ s d	£ s d	£ s d
To Stock of Finished Machines, 1st January 1905	240	12 18 4	3,100 0 0	
" Finished Stock from Works, as per Manufacturing A/c.	480	13 4 7	6,350 0 0	
" Machines Purchased and taken in Exchange ..	20	12 10 0	250 0 0	
				9,700 0 0
		Cost per Machine Sold		
" Management and Office :—				
Salaries	..	..	1,900 0 0	
Office Rent, Supplies, and Expenses	..	..	325 0 0	
Bank Commission.. ..	..	..	20 0 0	
Legal Expenses	..	..	60 0 0	
Audit Fee	..	..	50 0 0	
		5 10 10		2,355 0 0
" Distribution Expenses :—				
Agents' Salaries, Commissions, and Expenses ..	..	..	800 0 0	
Travelling Expenses ..	..	..	250 0 0	
Advertising	..	..	380 0 0	
		3 7 3		1,430 0 0
" Patent Fees, Renewals ..	..	..	230 0 0	
" Do. Rights, proportion written off	..	15/6	100 0 0	
				330 0 0
" Packing and Carriage Outwards..	..	8/11	..	190 0 0
" Leasehold Property, proportion written off	..	4/8	..	100 0 0
" Bad Debts (1 per cent. on Credit Sales)	..	5/8	..	120 0 0
		10 12 10		
" Balance carried to Profit and Loss Account :—				
Machines	..	7 2 4	3,025 0 0	
Accessories and Repairs	..	..	550 0 0	
				3,575 0 0
	740			£ 17,800 0 0

	No. of Machines	Average Price £ s d	£ s d	£ s d
By Sales	425	..	13,660 0 0	
Less Discounts	..	..	560 0 0	
		30 16 6		13,100 0 0
" Accessories :— Profit from this Department	..	..	..	250 0 0
" Repairing Shop :— Profit from this Department	..	..	..	300 0 0
" Stock of Finished Machines, 31st December 1905 ..	315	13 3 6	..	4,150 2 0
	740			17,800 0 0

ACCOUNTS FOR YEAR ENDING 31ST DECEMBER 1905 (*continued*).

III.—PROFIT AND LOSS ACCOUNT.

	£	s	d		£	s	d
To Insurance of Profits and Fixed Charges	20	0	0	By Balance from Trading Account	3,575	0	0
" Plant: Reserve Account, based on book value and probable life of machines likely to be superseded..	240	0	0	" Works: Rent or Interest on Capital from Manufacturing Account	200	0	0
" Bank Interest	50	0	0				
" Interest on Capital	1,210	0	0				
" Income Tax	105	0	0				
" Balance, Net Profit carried to Capital Account ..	2,150	0	0				
	£3,775	0	0		£3,775	0	0

ENGINEERING BUSINESS.

The business selected is an engineering one producing standardised types of machines, and it does not matter for the present purpose whether the works are regarded as manufacturing sewing machines, typewriting machines, calculating machines, bicycles, or any other class of machine, so long as the necessary degree of standardisation in the general organisation of the business is attained.

In a factory with a multifarious output the scheme here outlined could not be adopted with advantage, and it would be advisable to introduce a system of cost more suitable to the requirements of the business, as, for example, that described in the volume of "The Accountants' Library" under the title of "Multiple Costs."

The business under consideration produces four types of machine, and these are known in the workshops and counting-house, and also to the trade, as the A, B, C, and D models.

There are practically no other machines made by the firm, and should they at any time undertake the construction of a special article, either by way of experiment or in compliance with a special order, the work is treated as experimental or special work, and a separate costing prepared.

The firm is not supposed, however, to encourage orders for machines of irregular specification, knowing that profitable results in their business lie in the direction of uniformity of pattern and design.

The Balance Sheet of the concern at 31st December 1905, the Manufacturing or Factory Account, the Trading or Selling Department Account, and the Profit and Loss Account for the

twelve months preceding the date of that financial statement disclose the financial position of the business as at 31st December 1905, and the results of the manufacturing and trading for the year.

It is of the utmost importance, however, to know how far these results accord with the estimate the management prepared at the commencement of the year; and it must be assumed, in connection with all useful and practical schemes of cost, that a standard to measure the effective and profitable factory production has been established.

It is not conceivable that any practical business man will, with any hope of ultimate success, commence business, introducing his capital, without first endeavouring to ascertain the co-relationship of that capital, the factory output capacity, the cost under normal conditions of the articles to be produced, and the margins of gross profit on such production, out of which he has to meet working expenses and provide a fair return on the capital embarked in the undertaking.

Before proceeding to consider the accounts made up to the end of the year 1905, therefore, it will be of assistance to examine the standard to which the management has been adhering as closely as practicable during the year.

As has been pointed out, the factory produces four types of machine, and an estimate has been prepared about January, or as soon as it was possible to include the experience of the year 1904, as gleaned from the accounts of that year, in the general plan and estimate of commercial organisation and factory cost. This plan, it may be taken, has been in vogue for several years. Each added year of experience has contributed its quota of practical data to the scheme, and the accumulated knowledge of past working thus recorded enables the results of the immediate

future to be much more readily and correctly forecasted than if it were the probable results of the first year's trading that had to be estimated.

The effect of violent fluctuations in the purchase-price of raw material, and the result of disturbances in the skilled labour market, cannot be foreseen, and all systems of workshop estimating (as distinguished from estimating and tendering for large contracts in constructional undertakings where these contingencies may be partially covered) must be subject to the variations from the standard resulting from such causes.

It being possible, however, under the system here advocated to ascertain the actual results, as against the estimated or ideal, at short intervals, special efforts can be made to redress any adverse balance arising from additional and unforeseen cost by adjusting the selling prices where possible before this is too late. It is found sometimes that the selling price of the finished article is in no way governed by its prime cost, and it is thus impossible for the business to realise the required profit; but this consideration is outside the scope of the estimates and costings, which serve their purpose if they afford the management a ready means of ascertaining the actual and comparative results of the working at convenient intervals.

In order to cope with low selling prices it may be necessary to increase the manufacturing output by providing additional capital for further factory accommodation and plant, thus reducing the ratio of the standing charges by distributing their incidence on a broader basis, or it may be advisable to continue trading for a time with a less remunerative return on the capital employed. These considerations do not affect the main scheme of cost, which must have an ideal or pattern for effective working, and with which to test its day-to-day details and periodical results.

Capital.—

The supposititious business, the accounts of which are now under review, has a capital of £24,200, and, in addition to interest on this amount at the rate of 5 per cent. per annum, the proprietors desire a return on the money employed equal to 10 per cent. per annum. The capital not being held in the same proportion as the profit is shared, interest is charged in the Profit and Loss Account.

Works Capacity.—

Knowing the output capacity of their works, they calculate that during the ensuing year they should manufacture 500 machines. Regard must be had to the relative proportions in which the different grades will find a market, and it is estimated that the production must be on the following lines:—

A	Model	200
B	"	200
C	"	50
D	"	50
		500

Standard Costing.—

A standard costing of each model is prepared for the year on the basis of past experience, and this costing includes the material, labour, and proportion of shop expenses in respect of every part of the machine. Every operation by hand or machine is costed. The total costing, however, in this case is not built up from separate costs for each individual part, as would be the case in an engineering shop, where the machines were not being built, and the parts assembled, in sets.

Sets of 50.—

The machines being built to standard patterns pass through the works in sets, say fifty to a set, and all material and labour

classified and charged to the particular order number which in the initial stage is given to each set.

Material is given out from the stores in quantities sufficient for a set, and distributed amongst the workmen so that each class of mechanic has his own kind of material, and only in quantities to allow of fifty articles being made, say, cams, or fifty operations being performed—*e.g.*, threading a 3-inch nut, or "filing up" a 3" × 4" bracket.

Estimated Production.—

It is estimated that the 500 machines referred to will entail an expenditure in Material, Labour, and Shop Expenses (Manufacturing Account) of £6,675 made up thus:—

	Material	Labour	Shop Expenses, 100% on Labour	Total
200 Model A	£600	£1,200	£1,200	£3,000
200 „ B	560	1,120	1,120	2,800
50 „ C	95	190	190	475
50 „ D	80	160	160	400
500	£1,335	£2,670	£2,670	£6,675

On this basis the shop expenses are covered by adding 100 per cent. to the productive labour, the factory to be run at its full output. It may be found at the end of the year that the full average sales have not been maintained, but if the factory is to be run profitably it is necessary to manufacture under the most economic principles. A shortage in the selling output will probably cause a diminution of realised profit, but the first consideration is to manufacture under conditions which will allow of as large a margin of factory profit as possible, such margin enabling the Selling Department to dispose of the products, in an adverse market, at lower prices than those ruling at other times.

In this case the net profit would be less, but it is better that this should be so than that the factory should be restricted in its output, thereby occasioning a manufacturing loss, all margins being swallowed up by the dead charges.

The management forecast the working for the year 1905 as follows:—

Works Cost of producing 500 Machines as per foregoing details, based on Manufacturing Accounts of previous years, and the costings		£6,675 0 0
Add:—		
Management and Office Expenses ..	£2,000 0 0	
Distribution Expenses	1,400 0 0	
Provision for expiring Patents, Leases, and Reserves	600 0 0	
Based on Trading Accounts of previous years, and allowing for fluctuations which may be foreseen		4,000 0 0
Total Cost, excluding Interest on Capital ..		£10,675 0 0

Estimated Sales.—

ESTIMATED SALES (equal to full output of Factory).

200	A Machines at	£35 0 0	..	£7,000 0 0
200	B " "	33 0 0	..	6,600 0 0
50	C " "	22 0 0	..	1,100 0 0
50	D " "	18 0 0	..	900 0 0
500	Average ..	31 4 0		15,600 0 0

Add: Estimated Profit on Repairs, Work done, and Accessories sold	200 0 0	
		15,800 0 0
Estimated Balance available for appropriation		£5,125 0 0

Appropriation.—

APPROPRIATED THUS :—

Income-tax for year (average)..	£200	0	0
Interest on Capital, 5 per cent.	1,210	0	0
Profit, or Return on Capital employed (about 15 per cent.)	3,715	0	0
	£5,125	0	0

Selling Prices Reduced.—

It may, however, be found necessary to reduce the selling prices, in order to effect a sale equal to the works output, and it is decided to assume that it will be necessary to popularise the second grade machine by reducing the price to £27, although it may be some time before it will be possible to make any appreciable reduction in the manufacturing cost of the model in question.

This reduction in selling price has the effect of reducing the profit by £1,200: 200 B machines at £27, instead of £33, or a reduction £6 per machine, equal to £1,200.

Profit, as per original Estimate	£3,715	0	0
Less, Reduction in Price, as above	1,200	0	0
Estimated Net Profit ..	£2,515	0	0

NOTE.—It requires £2,420 to pay 10 per cent. on the Capital.

Having described the output the factory aims at, and mentioned the results probably to be realised from a ready and beneficial market for the production, it is now necessary to consider the means to be employed to tabulate the cost of the machines as they pass through the works.

Space being limited, the intention is to treat the subject on the simplest lines possible, care being taken to omit no essential features.

Purchases.—

The firm have a monthly pay day, and the invoices duly passed and certified, together with the Monthly Statements of the Suppliers, are produced to the principals at the time cheques are signed. At the same time a Monthly Summary Sheet is submitted, which, in addition to showing the amount of the month's purchases, shows an allocation of the materials bought or expenses incurred. A cheque is included for the monthly petty cash, a book on the imprest system being kept, and the total of the sheet must agree with the total amount shown, cheques drawn appearing in the Cash Book. Two subsidiary books are kept, one indexed under the names of suppliers and the other under the names and classes of the materials bought, for the purpose of facilitating reference in connection with the buying or costing details, but it is not found necessary to keep Ledger Accounts with the suppliers. Returns and credits are deducted from the statements and the net purchases dealt with.

A specimen ruling of the Monthly Summary Sheet is here given.

PURCHASES, &c., MONTHLY SUMMARY

PAYMENT						MANUFACTURING										
						Order Nos.					Stores, &c.					
No.	Supplier	Short Description	C.B. folio	Amount of Cheque	Initials	10	15	16	20	Folio	Sundry	Manufacturing Stores	Repairing Stores	Repairing Department	Folio	Sundry
				£ s d												

EXPLANATORY NOTES.

1. If large sheets are found inconvenient, the "Manufacturing" entries may be shown on a separate sheet.
2. The Summary sheets may be bound in book form after the monthly pay-day.
3. Important headings, and sub-divisions, of expenditure should be shown only. The subsidiary records will dissect as fully as desired.

SHEET OF ALL CHEQUE PAYMENTS.

ALLOCATION

					TRADING										CAPITAL		
Running Expenses																	
Loose Tools	Maintenance of Plant	Patterns	Shop Expenses		Machines Purchased	Accessories Bought	Packing and Carriage	Patent Fees	Office Rent, Supplies & Expenses	Distribution Expenses	Folio	Nominal Ledger	Folio	Private Ledger	Plant	Buildings	

EXPLANATORY NOTES—*continued.*

4. Weekly Wages Cheques for the month are shown and debited in total to Nominal Ledger Account.
5. Petty Cash Cheque for the month's expenditure is included and duly allocated.
6. The column headed "Initials" is for the verification of the Principal, who, approving the payment, signs the cheque.

The headings on the sheet agree with those appearing in the accounts, thus:—

Manufacturing Account.

Trading Account.

The monthly totals are posted to the respective accounts in the Nominal Ledger, the total of the twelve sheets constituting the grand debit to the Nominal Accounts.

For costing purposes, therefore, the purchases of material are fully covered, as the Manufacturing Order Nos. (a number for each set), or the Manufacturing or Repairing Stores, receive the full debits, as will be seen on referring to the *pro formâ* sheet on p. 78.

Manufacturing Stores.—

The Stores, as has been shown, are debited with the full purchases which cannot be allocated direct to a Manufacturing Order No., and in order that the Stores Department may be credited with the manufacturing materials and small tools, &c. (Shop Expenses), it is necessary to record the outward movements of the articles entrusted to the storekeeper. The record is kept in the following manner. A Stores Outwards Manifold Book is kept, in which is entered the number or weight, description, cost price, &c., of every article handed out to the workmen upon the requisition of the foreman. One copy is retained in the book and the other is passed into the office, where the particulars are priced out, summarised, and posted to the Manufacturing or Shop Expenses Accounts.

The copy remaining in the book may be made the source of original entry, or Day Book, for the credit side of a Stores Ledger, but this record is not found necessary in every engineering shop.

The Stores Sheet referred to should pass to the office weekly, and a convenient form of sheet is the following:—

(*a*) MANUFACTURING / REPAIRING } STORES OUTWARDS.

Week ending 19th May 1906. SHEET No. 19.

Date	Requisition No.	Description of Goods Withdrawn		Measurement							Rate	Amount	Charge to	
				Weight			Gallons	Dozens		Order No.			Order No.	Folio
				Cwt.	qrs.	lbs.				10 (*b*)		£ s d		

(*a*) Each Store will have its own system of sheets.

(*b*) A few spare columns should be provided where many issues are taking place to the same Order No.; it saves time to set apart a column to this Order No. and extend the total for the week. There must, of course, be a common denominator.

The Weekly Stores Sheet is completed in the office and summarised on a Stores Allocation (Monthly) Sheet, which latter need only give the reference to the Stores Sheet and the amount of the debit to each order number or account. Goods returned to stores are credited on the same lines.

The form of this sheet is here given:—

..... STORES ALLOCATION SHEET.

For Month of May 1906.

Weekly Sheet		Order Nos.					Shop Expenses	Loose Tools	Main-tenance of Plant	Patterns	Repairing Departm'nt	New Plant	
Date	No.	11	12	14	20	32	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
	(a)											£	(b)

NOTE.—The individual totals (a) are debited to Manufacturing Order Nos., Shop Expenses, &c., and the grand total (b) for the month credited to the Stores Account. Where there are many order numbers running in the same month, separate sheets may be employed for the Shop Expenses and other internal accounts.

The totals of the columns are posted monthly to the accounts in the Nominal Ledger, in like manner to those from the Purchases Allocation.

Wages.—

The usual methods are employed for checking the time of the workmen. Recording clocks are probably found to be the simplest and most correct system.

Each workman has a Time Card, on which he records, or on which is recorded, particulars of the work he has been doing for the day, and the number of hours engaged.

A specimen of a Time Card is given below:—

WORKMAN'S TIME CARD.

Workman's No.....

Name.....

Shop Order	Symbol	No. of Pieces	Particulars of Work Done	Given out	Passed	Time
					Hours	

Reference to Weekly Labour Sheet.....

From the Time Cards there is compiled a Weekly Labour Sheet for each shop order (or manufacturing number), and this sheet records the number of hours, and rate per hour, of each hand engaged upon the specified shop order for the week.

Upon these sheets being cast up and extended the total of each sheet is transferred to a Labour Summary Book, in which book the Weekly Sheet totals are recapitulated and gathered together in suitable and convenient form for posting to the

Manufacturing and Shop Expenses Accounts in the Nominal Ledger.

The Weekly Labour Sheet should be ruled on the following lines:—

LABOUR SHEET. Shop Order No. 13

Or Shop Expenses (Loose Tools Account), No. 59.

Week ending.....1904.

RATES PER HOUR.

Workmen's No.			9d.	8d.	7d.	6d.										
10																
12																
13																
20																
21																
30																
31																
32																
59																
Total Hours																
Amount ..																

Total for Week to....Summary Book, folio.... £ : :

The Labour Summary Book need not be further explained, as the ruling given at this point is self explanatory.

LABOUR SUMMARY BOOK.

Week ending	Sheet No.	Order Nos.						Foremen	Staff		Shop Expenses	Loose Tools	Maintenance of Plant	Patterns	Repairing Department	New Plant	Total
		11	12	13	20	23			Stores, Time, &c.								
								£ s d	£ s d		£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d

NOTE.—Individual debits to accounts in Nominal Ledger as suggested by the headings; Total credit to Wages Account.

Sales.—

The Sales Invoice or Day Book in use is one prepared and bound in such a way as to allow of its being typewritten by employing a book-typewriting machine. The actual invoice is typed, and a carbon copy imprinted upon the Sales Day Book.

The book should be made of suitable paper, so that if necessary it may be written up by hand. On the left-hand page of the book there appears the copy invoice, and the right-hand side is ruled with columns to dissect the sales into models and their classes, accessories, and repairs.

Alternatively, and this course is recommended, a Summary Sales Day Book may be kept for account purposes only. Each invoice represents a line of the book, and the dissection in money values and model numbers, &c., may be carried as far as necessary.

The Summary Sales Day Book ruling is as follows:—

SALES DAY BOOK (SUMMARY).

NOTE.—No details appear in this Day Book, as a book-typewriter is used, and an exact copy of the original invoice thus retained in the Sales Invoice Book.

Reference to Invoice Copy Book	Customer's Name	Town	No. of Machine	Amount of Invoice			Sales Led. fo.	Dissection of Sales																	
								A			B			C			D			Accessories			Repairing		
				£	s	d		£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d

NOTE.—There are columns showing the number of machines sold, running parallel with the A, B, C, D dissecting money columns.

One Sales Account, ruled to show each model separately (Numbers and Money), is opened in the Nominal Ledger for the machines sold, and Accounts for the Accessories and Repairs work.

Monthly Return.—

No regular Monthly Return is necessarily prepared, but the accounts are kept in such a manner that the general manager may have submitted to him at the end of any month, or week, if necessary, the position of the business at the given date.

(1) The Purchases Allocation has included every form of expenditure other than labour.

(2) The Labour Allocation includes every form of wages paid excepting Salaries. This latter item appears monthly in the Cash Book, and is debited direct to the Nominal Ledger.

(3) The Stores Summary in its allocation has distributed over the various "shop orders" the sundries built into machines or consumed as shop expenses.

(4) The Sales Accounts show the monthly totals.

Upon a Trial Balance of the books being taken out for an interim purpose the debits to the Manufacturing Accounts in the Nominal Ledger may be taken safely as "Work in hand at cost" (subject to personal knowledge confirming the figures), and no stock need be taken.

The Balance or Stores Account may be taken as stock-in-hand, subject to 5 per cent. for wastage, or what the annual survey has shown to be the percentage. In some stores there is a small percentage of gain arising through all fractions of a penny being costed to the nearest penny above the invoice price.

In preparing the Monthly Account it will be necessary to apportion the shop expenses over the manufacturing orders, but the figures need not be put through the books. A memorandum abstract will afford the information.

Shop Expenses.—

As will have been observed from the treatment and allocation of Purchases and Labour, the Shop Expenses, arising as they do under one or other of these heads, have been properly dissected and find their way in due course to the accounts in the Nominal Ledger. Their incidence and bearing upon the cost of the production will be dealt with in the reconciliation of the accounts at the close of this section.

At the end of the financial year the Shop Expenses are grouped under one head, and represent the indirect or running expenses of the shop for the twelve months.

On reference to the Nominal Ledger these are found to be as follows:—

Staff Wages (Storekeeper, Timekeeper, Gateman, &c.).
Foremen's Wages.
Lighting and Heating.
Rent of Factory (Interest on Capital).
Rates.
Insurance (Fire, Workmen's Compensation).
Loose Tools consumed (Purchases, Wages, and Adjusment of Stores in hand).
Patterns.
Maintenance and Running Expenses of Machinery and Plant.
Depreciation of Plant.
Works Superintendent's Salary.

The above expenses must be apportioned over the work done (machines finished or partly built), as it appears in the several Manufacturing Accounts in the Nominal Ledger.

The apportionment is best accomplished and most clearly shown by means of a tabular statement embracing all the Manufacturing Accounts for the period and the relative Shop Expenses for that period.

The following is an illustrative form or table showing such apportionment, and there is also subjoined a table of the actual Shop Expenses which it was necessary to cover.

ILLUSTRATIVE FORM.

TABLE SHOWING ALLOCATION OF

N.L. Reference	Manufacturing Order No.	Description	Work in Hand 1st January 1905			
			Material	Labour	Shop Expenses	Total
		SECTION I.—ORDERS IN HAND AT 1st JANUARY 1905:—	£	£	£	£
50	13	50 A Model	150	300	270	720
54	17	50 B "	102	262	236	600
62	21	50 C "	94	190	171	455
73	23	1 Special Pattern	6	10	9	25
			£352	£762	£686	£1,800
		SECTION II.—ORDERS COMPLETED WITHIN THE PERIOD:—				
77	31	50 D Model	..	..	..	..
81	36	50 A "	..	..	..	..
87	40	80 A "	..	..	..	..
93	45	100 B "	..	..	..	..
97	57	50 B "	..	..	..	..
		SECTION III.—ORDERS IN HAND 31st DECEMBER 1905:—				
103	79	50 A	..	..	..	..
107	81	50 B	..	..	..	..
111	82	50 C	..	..	..	..
116	96	50 D	..	..	..	..
125	100	Assembling parts under Shop Order numbers (a line for each) allocated to Manufacturing Order numbers later..	..	..	..	..
			£352	£762	£686	£1,800

NOTES.—1. The allocation takes place monthly, or as desired. See page 88. The above table illustrates an apportionment of a year's expenses.

SHOP EXPENSES FOR YEAR 1905.

DEBIT						CREDIT							
Twelve Months ending 31st Dec. 1905					Total Debit to Manufacturing A/c.	Work in Hand 31st Dec. 1905				Production			Total Credit to Manufacturing A/c.
Material		Labour from Sum'ary Book	Shop Expen's 85% on Labour	Total		Material	Labour	Shop Expenses	Total	No.	Model	Shop Cost	
Charg'd Direct	From Stores												
£	£	£	£	£	£	£	£	£	£			£	£
..	6	13	11	30	750	..	..	..	..	50	A	750	
..	13	40	34	87	687	..	..	..	..	50	B	687	
..	10	19	16	45	500	..	..	..	..	50	C	500	
..	2	15	13	30	55	8	25	22	55				1,937
120	20	154	131	425	425	..	..	..	..	50	D	425	
121	33	325	276	755	755	..	..	..	..	50	A	755	
182	76	520	442	1,220	1,220	..	..	..	..	80	A	1,220	
184	93	580	493	1,350	1,350	..	..	..	..	100	B	1,350	
91	46	284	242	663	663	..	..	..	..	50	B	663	
													4,413
95	6	210	179	490	490	101	210	179	490				
100	32	280	238	650	650	132	280	238	650				
40	40	200	170	450	450	80	200	170	450				
50	45	165	140	400	400	95	165	140	400				
60	35	195	165	455	455	95	195	165	455				
						£511	£1,075	£914	£2,500	..	..	..	2,500
£1,043	£457	£3,000	£2,550	£7,050	£8,850	£511	£1,075	£914	£2,500	480		£6,350	£8,850

2. A Schedule of the Shop Expenses for the period covered will be found on page 92.

SCHEDULE OF SHOP EXPENSES, YEAR 1905.

					Year 1905	Monthly Average	Monthly Estimate for 1906
					£ s d	£ s d	£ s d
Staff Wages—Storekeepers, Timekeeper, Gateman, Messengers, &c.					245 0 0	20 0 0	22 0 0
Foremen's Wages					400 0 0	33 0 0	35 0 0
Light, Heat, &c.					80 0 0	7 0 0	8 0 0
Rent (including Power)					200 0 0	17 0 0	17 0 0
Rates					60 0 0	5 0 0	6 0 0
Insurance—Fire and Workmen's Compensation					50 0 0	4 0 0	5 0 0
Loose Tools consumed :—							
Stock, 1st January 1905				£1,400 0 0			
Purchases direct				190 0 0			
Charged up from Stores				50 0 0			
Labour on Tools				60 0 0			
				1,700 0 0			
Less Stock, 31st December 1905..				1,500 0 0			
					200 0 0	1 0 0	20 0 0
Patterns :—							
Value, 1st January 1905				600 0 0			
Purchases direct				300 0 0			
Stores Department..				90 0 0			
Pattern Makers				120 0 0			
Drawing				80 0 0			
				1,190 0 0			
Less Value, 31st December 1905..				1,000 0 0			
					190 0 0	16 0 0	20 0 0
Maintenance of Plant :—							
Renewals (new parts) .. 1							
Repairs 2							
Oil, Waste, &c. 3							
	Purchases.	Stores.	Labour.	Total.			
1	70	10	20	100			
2	50	60	40	150			
3	—	45	30	75			
					325 0 0	27 0 0	30 0 0
Depreciation of Plant—based on life of productive Plant, taken in classes, and adjusted to an average					250 0 0	21 0 0	22 0 0
Works Superintendent, salary					550 0 0	46 0 0	50 0 0
					£2,550 0 0	£213 0 0	£235 0 0

Nominal Ledger.—

There is no space here to give copies of all the Nominal Ledger Accounts, but a few are given, and the selection is made with a view to giving the accounts which are most calculated to illustrate and indicate the lines on which the whole scheme of cost accounting may be worked to the greatest advantage.

LEDGER ACCOUNTS.

Dr. MACHINERY AND PLANT. *Cr.*

1905		£	1905		£
Jan. 1	To Balance	5,975	Dec. 31	By Obsolete Plant Sold, scrap	30
Mar. 31	" Purchases	130	"	" Transfer to Reserve Account	450
Dec. 31	" Do.	300	"	" Depreciation for Year (*a*)	250
"	" Labour	200	"	" Balance, as per Balance Sheet ..	5,875
		£6,605			£6,605

(*a*) The Plant Book (number for each tool) shows on an abstract being made that the value of the Plant is as under :—

Original Cost	Illustration.	Depreciation.
£		£
100	1. Fast-running Machines and Tools for special work..15 % ..	15
100	2. Do. do. (running double shifts)..20 % ..	20
100	3. Electrical Plant .. ..10 % ..	10
2,500	4. General Plant .. .. 5 % ..	125
3,200	5. Do. do. (long life) .. .. 2½% ..	80
£6,000		£250

Dr. STORES ACCOUNT (SUMMARY). *Cr.*

1905		£	1905		£
Jan. 1	To Stock	1,376	Jan. to Dec. 31	By Transfers to Manufacturing.. ..	457
Jan. to Dec.	" Purchases	331	" "	" Do. Repairing Department ..	*
			" "	" Stock of Stores, £1,265 Reserved .. 15	1,250
		£1,707			£1,707

NOTES.—The Stock at December 31st 1905 on being taken worked out at £1,265, the difference of £15 was reserved to credit of Stores.

The above account is a specimen where it is convenient to treat Stores in one total.

Accounts may be opened dealing with the Stores in sections—*e.g.*, Bar Iron and Steel, Paint and Oil, Timber, &c.

* Repairing Department in this case has its separate Stores.

LEDGER ACCOUNTS (*continued*).

Dr. ACCESSORIES ACCOUNT. *Cr.*

		£			£
1905 Jan. 1	To Stock	120	1905 Jan. to Dec.	By Sales, net	750
Jan. to Dec.	" Purchases, net ..	500	" "	" Stock at Cost.. ..	150
" "	" Direct Expenses—*e.g.*, Carriage ..	30			
" "	" Profit to Trading Account	250			
		£900			£900

NOTE.—It is not deemed necessary to apportion Establishment Charges to this account. Where it is considered preferable to do so it should not be difficult to establish a percentage to effect this object.

Dr. REPAIRING DEPARTMENT. *Cr.*

		£			£
1905 Jan. 1	To Stock	20	1905 Jan. to Dec.	By Work done	600
Jan. to Dec.	" Purchases	160	Dec. 31	" Repairing Material and Parts at Cost..	100
" "	" Labour	120			
" "	" Shop Expenses ..	100			
" "	" Profit to Trading Account	300			
		£700			£700

MEMO.—Profit, as above £300
Less Rent of Repairing Shop, charged direct to Trading Account as Leasehold Property Amortisation Account 100
Profit £200

NOTE.—This Department has its own Shop Expenses charged direct; and, as in the case of "Accessories," the Establishment Charges are not allocated.

Dr. FACTORY RENT AND RATES. *Cr.*

		Fo.	District	Poor	Sch. A	Rent	Total			Fo.	Total
			£	£	£	£	£				£
1905 Mar.	To District Rate		15	..	..	..	15	1905 Mar.	By Income Tax Account—Sch. D ..		10
Apr.	" Income Tax (Sch. A) ..		..	..	10	..	10				
Sept.	" Poor Rate ..		..	20	..	..	20				
Dec.	" District Rate		25	..	..	..	25	Dec.	" Manufacturing Account ..		260
"	" Property: Profit and Loss A/c..		..	..	..	200	200				
		£	40	20	10	200	270			£	270

NOTE.—The Rent of £200 includes motive power in this case.

LEDGER ACCOUNTS (*continued*).

Dr. BAD DEBTS RESERVE. *Cr.*

One per Cent. on Credit Sales.

		£			£
1905 Dec. 31	To Bad Debts written off during Year as per Bad Debt Account	80	1905 Jan. 1	By Balance	460
"	" Balance as per Balance Sheet	500	Dec. 31	" Trading Account—1 per cent. on Credit Sales for Year	120
		£580			£580

The following main Ledger Accounts are also opened, and the method of keeping them already indicated from the Manufacturing, Trading, and Profit and Loss Accounts, and relative schedules given as illustrations.

Further Ledger Accounts:—

LEDGER ACCOUNTS (*continued*).

BALANCE SHEET.—

Freehold Land and Works.

Leasehold Property.

Office Furniture.

Finished Stock (Warehouse).

Work in Progress (Manufacturing Account).

Loose Tools } *See* Schedule of Shop Expenses, p. 92.
Patterns and Drawings } for method of treatment.

Sundry Creditors.

Sundry Debtors.

Patents and Patent Rights (Ledger Account dissected to show duration and other particulars).

Goodwill.

Reserve for Renewal and Improvement of Machinery and Plant (*See* Balance Sheet).

Capital Accounts.

MANUFACTURING.—

Purchases.

Labour (Debit from Summary Book).

(Credit from Manufacturing Account).

Staff Wages (Dissected to show Classes).

Foremen's Wages (Dissected to show Departments or Divisions).

Lighting and Heating, &c. (Divided under suitable headings).

Insurance (Divided under suitable headings).

Maintenance of Plant (*See* Shop Expenses Schedule).

Depreciation of Plant (*See* Machinery and Plant Account illustration)

Works Superintendent's Salary.

TRADING.—

Machines Purchased (if any).

Salaries.

Office Rent, Supplies, and Expenses (Fully dissected in a Subsidiary Columnar Book).

Bank Commission.

Legal Expenses.

Audit Fee.

Agents' Salaries, Commissions, and Expenses (Detailed in Subsidiary Book under Towns and divisions of expense).

Travelling Expenses (Dissected under Districts, and Travellers, in Subsidiary Book).

Advertising (Detailed under Trade, General, and Classified Journals, and other methods of advertising).

Patent Fees (Details of Patents, Dates, Countries, &c.).

Packing (Divided to show Material, Labour, Stores, &c.).

Carriage and Freightage (Details under suitable divisions).

Bad Debts.

Sales (Account dissected to show Models, &c.).

PROFIT AND LOSS.—

Bank Interest.

Interest on Capital.

Income Tax.

Insurance of Profits and Fixed Charges (A provision of this kind may be treated as part of the Establishment Charges under the Trading Account division).

Reconciliation.—

A reconciliation, or at least a comparison, of the estimated cost of the production—which was the aim of the management at the beginning of the year—with the actual number of machines produced, and relative cost, is now possible, the Cost Accounts for the year being complete.

The monthly comparisons have enabled a check to be kept on the labour, which is probably the most important item in a works of this description, and the allocation of all the main purchases of material direct to the shop orders (on the basis of the specified material required) is a check in itself on wastage in this direction. The stores also afford the check required to safeguard leakage in that department.

The reconciliation of the estimate with the actual is as follows:—

COMPARISON OF ESTIMATE AND ACTUAL.

Estimated Number	FACTORY OUTPUT.	Actual Number
200	Model A	180
200	" B	200
50	" C	50
50	" D	50
500		480

COMPARISON OF ESTIMATE AND ACTUAL—(*continued*).

Estimate £ s d		Actual £ s d	£ s d
	MATERIAL.		
1,275 0 0	Material in 480 Machines, estimated.		
	Material charged direct and from Stores ..	..	1,341 0 0
66 0 0	Loss on the Estimate.		
£1,341 0 0	See Note 1.		£1,341 0 0
	LABOUR.		
2,550 0 0	Labour in 480 Machines, estimated.		
	Actual Labour as per Allocation	..	2,687 0 0
137 0 0	Loss on the Estimate.		
£2,687 0 0	See Note 2.		£2 687 0 0
	SHOP EXPENSES.		
	Shop Expenses based on estimated labour in 500 Machines at 100 %.		
2,670 0 0	100 % on £2,670.		
	Actual Shop Expenses for Year, 85 % on £3,000 = £2,550.		
	Shop Expenses actually borne by the 480 Machines completed :—		
	1904, Expenses on Work in hand	677 0 0	
	1905, Do. in Factory Output	1,645 0 0	
			2,322 0 0
	Gain on the Estimate :—		
	Reduction in Expenses through economy in factory administration	120 0 0	
	Saving on Expenses owing to increased Output—the work in hand at end of Year being heavier	* 228 0 0	
			348 0 0
£2,670 0 0	* NOTE.—Increase in Productive Labour on Work in hand, £313 at 85 % : Gain ..		£2,670 0 0
	Five per cent. on Labour on Work in hand 1904, when ratio was 90 % on Labour : 5 % on £762, Loss	266 0 0	
		38 0 0	
		£228 0 0	

COMPARISON OF ESTIMATE AND ACTUAL—(*continued*).

Estimate £ s d	SALES.		Actual £ s d	Actual £ s d
	500	Machines at average price of £31 4 0	15,600 0 0	
14,400 0 0		Revised price 28 16 0	14,400 0 0	
	425	Machines actually sold, at average price of £30 16s. 6d.	..	13,100 0 0
		Credit to Sales Department for increase in number of Models in Stock as under:—		
	45	1904 Pattern at Shop Cost price, viz. ..	13 4 7	
		Written off to reduce to Shop Cost for 1905	0 6 3	
			12 18 4	
	10	1905 Pattern at	12 18 4	
	20	Foreign make, purchased or taken in part exchange, valued on merits—average	3 12 5	
	500	55 at £12 18 4	..	727 12 1
		20 " 3 12 5	..	72 7 11
		Balance, being Loss on the Estimate	..	500 0 0
£14,400 0 0			£	14,400 0 0

COMPARISON OF ESTIMATE AND ACTUAL—(*continued*).

Reference to Notes	SUMMARY.	Loss on Estimate £ s d	Gain on Estimate £ s d
	MANUFACTURING:—		
1	Material (see p. 101)	6 0 0	
2	Labour	17 0 0	
3	Shop Expenses	..	348 0 0
	TRADING:—		
4	Management and Office	355 0 0	
5	Distribution Expenses	220 0 0	
6	Expiring Patents, Leases, and Reserves ..	..	50 0 0
7	Sales	500 0 0	
8	Accessories and Repairing Departments ..	..	350 0 0
		1,098 0 0	748 0 0
	PROFIT AND LOSS:—		
9	Income-tax	..	95 0 0
10	Insurance of Profits	20 0 0	
11	Bank Interest	50 0 0	
12	New Plant (Reserve)	240 0 0	
13	Rent (Interest)	..	200 0 0
		1,408 0 0	1,043 0 0
	NET PROFIT:—		
	Estimated £2,515 0 0		
	Actual, as per Accounts .. 2,150 0 0		
		..	365 0 0
		£ 1,408 0 0	£1,408 0 0

COMPARISON OF ESTIMATE AND ACTUAL—(*continued*).

NOTES ON THE VARIATIONS FROM THE ESTIMATES.

1. MATERIAL.—The cost of Material has been under-estimated, it having been found necessary to use a better class of steel and iron in certain models.

	Estimate.	Actual.	Loss.	Gain.
	£	£	£	£
180 A	540	568	28	—
200 B	560	529	—	31
50 C	95	104	9	—
50 D	80	140	60	—
	1,275	1,341	97	31
Loss on Material Estimate..	66	—	—	66
	£1,341	£1,341	£97	£97

2. LABOUR.—

	Estimate.	Actual.	Loss.	Gain.
	£	£	£	£
180 A	1,080	1,158	78	—
200 B	1,120	1,166	46	—
50 C	190	209	19	—
50 D	160	154	—	6
	2,550	2,687	143	6
Loss on Labour Estimate ..	137	—	—	137
	£2,687	£2,687	£143	£143

The Labour bill has also over-run the Estimates for the year, an advance in the rate paid to skilled artificers having taken place.

N.B.—The Estimates for the year 1906 will have to be based on the higher rates for material and labour now obtaining.

3. SHOP EXPENSES.—A direct saving of £120 has been effected by factory economies, the actual expenses being less than the estimate by that amount £120

The Output, however, has been increased, and the incidence of the Shop Expenses thus distributed over a heavier productive labour bill with a beneficial result, the credit to current Manufacturing Account being 228

£348

NOTE.—The three main elements of cost summarised show as follow:—

		Loss. £	Gain. £
Material—Loss on the finished output as above	£66		
Balance of estimated material included in work on hand	60		
		6	
Labour—Loss on the finished output as above	137		
Balance of estimated labour included in work on hand	120		
		17	
Shop Expenses—Gain as above			348
Net Prime Cost Gain as per Accounts ..		325	—
		£348	£348

The Shop Expenses, as originally estimated at £2,670, on a labour bil of the same amount were considered reasonable, and the variation in the results have not caused any undue loading of work in hand.

4 & 5. MANAGEMENT, OFFICE, AND DISTRIBUTION.—A change in the management took place during the year, and higher salaries were paid than those anticipated at time of preparing the budget for 1905. Special expenses had also to be incurred in order to place a remunerative number of machines on the market.

6. EXPIRING PATENTS, &c.—This expense was over-estimated in the budget—clerical error.

7. SALES.—Details on p. 99.

8. ACCESSORIES AND REPAIRS.—These departments considerably increased their turnover, and in the Repairing Shop the economical use of "parts" and sundries contributed largely to the gain.

9. INCOME-TAX.—The saving here arises on a successful appeal under Section 133, the year 1904 having fallen short of the average owing to disturbance through a reorganisation of the works and the introduction of modern plant and equipment.

10. INSURANCE OF PROFITS.—Not decided upon at time of estimating.

11. BANK INTEREST.—Not included in budget—treated as profit.

12. NEW PLANT (Reserve).—This was not in contemplation by the management at the beginning of the year. It is in the nature of a prudential reserve out of profits.

13. RENT (Interest on Capital invested in the Buildings).—This interest was treated as a shop expense in the budget, but inadvertently omitted from the Estimate on the Credit side.

SECTION III.

BREWERY ACCOUNTS AND COSTINGS.

BREWERY COSTINGS.

THE business of a brewer was referred to in the introductory notes as one having a natural unit or means of measurement and comparison. This applies not only to matters as affecting production and cost, but also with equal force to questions arising on the distribution expenses, selling prices, and averages.

In the case of a brewery the barrel of beer (thirty-six gallons) is taken as the standard of measurement. It is not a difficult task to convert all larger and smaller quantities to the unit of one barrel, and the barrelage therefore becomes a ready, and probably more correct than any other, standard by which to measure the output capacity of the brewery, the general volume of the trade done, its division into districts, or, it may be, over houses controlled.

For the better consideration of the costings it will be useful to submit at this stage a *pro formâ* illustration of a Brewery Trading Account, divided into two sections, thus:—

I. Brewing Account showing Production and Cost.

II. Trading Account giving the Distribution of the Products, Expense attending this, and the Balance of Profit.

In order to simplify the figures, the accounts here shown are for one month only, but the illustration will serve for the purposes and preparation of the usual yearly or half-yearly accounts.

There are also submitted at this point the following specimen accounts and rulings:—

III. *Pro formâ* Costing of a Brewing of Ale, Quality X.

I.—BREWING ACCOUNT, Month of December 1905.

	Barrels	Per Barrel	£ s d
To Materials consumed :—			
English Malt, 200 qrs. at 33/9 per qr.	..	3/4·50	337 10 0
Foreign " 160 " " 33/- " "	..	2/7·75	264 11 8
		6/0·25	
Hops .. 26·6 cwt. " 150/- " cwt.	..	2/0·00	200 0 0
Sugar .. 288·8 " " 15/- " "	..	2/2·00	216 13 4
Other Materials	..	3·25	217 1 8
" Beer Duty (Standard 7/9)	..	6/6·00	650 0 0
		16/11·50	£1,695 16 8
			£ s d
To Production, brought down	2,000	16/5·38	1,644 16 8
" Working Expenses :—			
Wages	..	1/3	125 0 0
Water	..	1·50	12 10 0
Coal	..	5·70	47 10 0
Rent and Rates	..	6·00	50 0 0
Light..	..	1·20	10 0 0
Insurance	..	·60	5 0 0
Cooperage and Stores	..	2·40	20 0 0
Repairs	..	1·80	15 0 0
Depreciation	..	3·60	30 0 0
		3/1·80	315 0 0
	2,000	19/7·18	£1,959 16 8

	Barrels	Per Barrel	£ s d
By Production, carried down	2,000	16/5·38	1,644 16 8
" Residuals :—			
Grain, Yeast, &c...	..	6·12	51 0 0
	2,000	16/11·50	£1,695 16 8
			£ s d
By Trading Account	2,000	19/7·18	1,959 16 8
	2,000	19/7·18	£1,959 16 8

II.—TRADING ACCOUNT for Month of December 1905.

	Barrels	Per Barrel	£ s d		Barrels	Per Barrel	£ s d
To Stock, December 1	100	19/10	99 3 4	By Sales .. .. X XX XXX G. B.	1,994	37/6·50	3,742 18 1
" Production at Brewing Cost ..	2,000	19/7·18	1,959 16 8				
" Distribution and Management Expenses, detailed	..	4/5·09	450 0 0	" Bottling Department..	40	32/0	64 0 0
					2,034	37/5·19	3,806 18 1
" Balance to General Profit and Loss Account	..	13/4·78	1,362 11 6	" Allowances— Customers	14	19/7·18	13 14 4
				Yard	2	19/7·18	1 19 2
	..	37/5·05		" Stock at close, December 31 ..	50	19/7·18	48 19 11
	2,100		£3,871 11 6		2,100		£3,871 11 6

III.—PRO-FORMA COSTING (BREWING No. 23.)

QUALITY X[1] August 20th 1905.

Quantity	Materials	Price	Details	Amount	Stock Book Fo.	
			£ s d	£ s d		
	MALT—					
6 Qrs. ..	English	36/6	10 19 0			
5 do. ..	Foreign	35/6	10 13 0			
				21 12 0		Brewers' records and Memoranda as to Extracts, Gravities, &c.
	SUGARS—					
4 Cwt. ..	Lexeros	14/9	2 19 0			
4 do. ..	Dextros	12/9	2 11 0			
40 Lbs. ..	Caramel	3d.	0 10 0			
				6 0 0		
	HOPS—					
100 Lbs. ..	Details	1/3	6 5 0			BARRELS—
				6 5 0		Brewed .. .. 82·5
	SALTS—					Racked .. .. 80·0
20 Lbs. ..	Details	1¼d.	..	0 2 1		Loss (3.03 per cent.) .. 2·5
	PRESERVATIVES—					
10 Lbs. ..	Details	5d.	0 4 2			
20 Galls. ..	Finings	3½d.	0 5 10			
				0 10 0		
56·66 ..	DUTY—	7/9	..	21 19 2		
				56 8 3		
	Credit—					PRODUCTION—
98 Strikes	Grains	4½d.	..	1 16 9		80 Barrels at a cost per Barrel
				£54 11 6		of 13/7·72 .. .. ≐£54 11 6

NOTE.—The above items making up the Cost are credited in detail to the Stock Accounts, and Ales Racked (X Account) debited; or in Journal Entry Form it may be stated thus:—

Ales Racked "X" ..	*Dr.* £54 11 6	
Grains	*Dr.* 1 16 9	
Sundry Stock Accounts		*Cr.* £56 8 3

The details of each brewing are posted up from the individual costing to the credit of the respective Material Accounts in the Cost Ledger, quantity or weight being shown therein, in addition to the money value.

The Materials Accounts in the Cost Ledger receive their debits from the monthly totals of the Purchases Journal (commercial books), and the balance on any account at the end of the month represents the stock on hand of that class at cost price.

In order to prove the clerical accuracy of the postings to the Stock Accounts, the total of each Cost Sheet (*e.g.*, £56 8s. 3d. in the illustration given) should be posted to a Beer Racked Account, the number of barrels also being entered.

The Cost Ledger will then balance within itself, the total of the balances representing, on their being extracted by means of a Trial Balance, the stocks on hand at cost and the beer produced also at cost price.

The Beer Racked Account just referred to must, however, be subdivided, in order to clearly show the monthly output under the classes of beer produced, *e.g.*:—

X	1,130	Barrels
X X	250	,,
X X X	200	,,
X X X X	150	,,
B. B.	150	,,
G. B.	100	,,
S.	20	,,
	2,000	,,

It should be possible from the records described not only to check the details of the stocks and show a costing of each brewing, but to afford periodically, as desired, the average cost to date of any particular class of beer over a given period.

Columns are inserted to show the number of barrels brewed and wastage. A column is also provided exhibiting the number of standard barrels or the basis of the duty paid.

The commercial books show the disposition of the brewery production, and an agreement between the Stock Book and the actual sales, less returns, is easily effected, as will be seen from the illustrations.

It will be necessary to allow for that portion of the "Returned Ales" which has been treated by the brewer and resold in the ordinary course of trade. These, on the one hand, must be debited to the Racking Department, as they will, of course, be credited to the Stock Accounts on the ale being sent out a second time.

Reference was made to balancing the Stock Book, or Cost Ledger, and to employing a form of Trial Balance in the same manner as this account is taken, in view of the preparation of a Balance Sheet and set of accounts at any given date.

If it should be found necessary—and this must be determined by the magnitude of the brewery's operations—to prove the costings, say, monthly, or quarterly, a convenient method is to have sheets ruled so as to show under printed side-heads (or hand-written, as the case may be) the various classes of Stock Accounts, with columns to show the following details:—

MALT (ENGLISH).

Column	1	Stock at January 1st 1905.
,,	2	Purchases for Month (less Returns).
,,	3	Withdrawals ,,
,,	4	Stock at January 31st 1905.

The first and fourth columns of this Trial Balance, or abstract, represent the stocks on hand at the respective dates. The second column denotes the purchased materials for the month,

and the third column should represent the total credits as posted from the Costing Sheets.

It should be noted that the by-products (grains, barm, &c.) form a credit to the costings, and appear as debits in the Stock Accounts.

The sheets may duplicate the rulings, and show further abstracts to the right-hand side, thus saving some re-writing of names, and also giving the information in a convenient and comparative form.

The following Trial Balance will illustrate the foregoing observations. Owing to the exigencies of space it has been reduced to main headings only.

COST LEDGER.

Monthly Abstract of Consumption and Production and Trial Balance, August 31st. 1905.

Folio	Account	Stock, August 1st 1905			Purchased or Debited			Withdrawn or Credited			Stock, August 31st 1905			Trial Balance	
		Quantity			Quantity			Quantity			Quantity			Consumption	Production
		Qrs.	Bush.	£	Qrs.	Bush.	£	Qrs.	Bush.	£	Qrs.	Bush.	£	Dr. £	Cr. £
	Malt—														
2	English 33/9	1,000	..	1,687	..	..	..	200	..	337	800	..	1,350	337	
5	Foreign 33/-	1,000	..	1,650	..	..	..	160	..	265	840	..	1,385	265	
		Cwt.													
20	Sugar (Lexeros) .. 15/-	400	..	300	100	..	75	270	..	202	230	..	173	202	
50	Hops £8	50	..	400	60	..	480	25	..	200	85	..	680	200	
70	Salts 10/-	120	..	60	..	..	..	100	..	50	20	..	10	50	
90	Preservatives	..	..	25	..	..	10	..	..	10	..	..	25	10	
100	Duty	..	..	..	..	..	650	..	..	650	..	..	..	650	
	Debit from Purchase Jrnl.	..	..	..	..	..	1,215								
	Credits from Costings ..	..	..	..	..	..	..	..	..	1,714					
130	Grains—							Strikes							
	Debit from Costings ..	..	..	..	..	..	..	3,000	..	50	..	..	..	..	50
	Credit from Transfer to Sales Department ..	..	..	..	3,000	..	50								
200	Ale Racked—														
	X														
	X X														
	X X X														
	(detailed).							Barrels							
	Debit from Costings ..	..	..	..	..	..	..	2,000	..	1,664	..	..	..	..	1,664
	Credit by Transfer to Sales Department ..	..	..	..	2,000	..	1,664								
				£4,122			£2,929			£3,428			£3,623	£1,714	£1,714

Note.—Further ruled space to the right-hand will allow of additional abstracts being given in comparative form.
For Trial Balance purposes the Balances Columns alone are required.
Beer Duty may be dealt with differently and kept out of the Costings, but it is convenient to treat it directly as an element of cost.
Stock of Ales.—The Stock is debited to the Sales Department, as, and when, transferred, that Department keeping its own Stock Records divided under qualities, sizes, &c. &c.

STOCK BOOK.

The book should be indexed, and divided into sections on the following lines:—

(1) *Materials:* Malt.
Patent Grist.
Sugars.
Hops.
Salts.
Preservatives.

(2) *Duty.*

(3) *By-products.*

(4) *Ales Racked.*

Each section should be subdivided into as many headings as found practicable, it being noted that the further the dissection is carried the more effective will be the check upon the consumption of material, and consequently the more accurate the costings, both as regards the individual as well as the accumulating or average costing.

For example, sugar might be divided into:—

Lexeros, at 14s. 9d. per cwt.
Dextros, at 12s. 9d. per cwt.
Saccharine.
Caramel, &c. &c.

A separate account, or page, is advisable for each parcel, especially where the prices differ.

It is not necessary to furnish rulings of a full Working-Cost Ledger, but two accounts, or pages, may be given as fairly indicative of the system outlined.

Example I.—Malt Account (English) (New Season).

Example II.—Ales Racked (X).

COST LEDGER.

The following are specimen accounts in the Cost Ledger, which book, for convenience in keeping, might with advantage in a large concern be divided into more than one book, but forming as a whole a self-contained and balancing Ledger.

(Ledger Folio 69.) **MALT ACCOUNT (English 33/9 per quarter.)**

Particulars of Storage:
WAREHOUSE B. ROOM 1.

Contract Particulars:
Supplier.....5,000 Quarters.

Deliveries:

1905	Qrs.	Bushels
Jan. 7	100	6
14	250	4
19	68	2
21	166	0

Dr. *Cr.*

Date	Supplies	Purchase Journal Reference	Qrs.	Bus.	£ s d	Date	Withdrawals	Cost Sheet Reference	Qrs.	Bus.	£ s d
1905						1905					
Jan. 1	To Stock	..	100	..	168 15 0	Jan. 7	By Brewing No. 13 from Cost Sheet	..	20	..	33 15 0
31	" Purchases: Month ..	..	200	..	337 10 0	Dec. 31	" Sundry Brewings (detailed)	..	230	..	388 2 6
						"	" Stock	..	50	..	84 7 6
			300	..	£506 5 0				300	..	£506 5 0

NOTES.—The Purchases are debited, net, all Returns or Allowances being deducted.
The Account would probably be opened and closed within the limits of the financial year. Stocks are shown, however, as an example of the position at an interim balancing for office or other purposes.
Any balance on a Material Account arising through gain or loss through atmospheric or other conditions should be transferred to a "Gain and Loss" Account, one being opened under each main head. The net balance on such an account would form a debit, or credit, to the general production or Brewing Account.

COST LEDGER

(Ledger Folio 173).

ALES

Dr. BREWED.

Date	Reference to Cost Sheet	Standard Barrels for Duty	Barrels Brewed Bulk	Waste, Fermentation, &c.	Per cent. of loss	Barrels Racked	Cost per Barrel for the Brew	Cost per Barrel to date	Cost per Brew
									£ s d
1905 Jan. 5	7	...	83	3	3·61	80	13/6	13/6	54 0 0
20	34	..	82	2	2·44	80	14/-	13/9	56 0 0
Dec. 31	Sundry Brews detailed	..	3,000	75	2·50	2,925	13/3	13/3·31	1,937 16 3
			3,165	80		3,085			£2,047 16 3

NOTES.—The above Form gives Barrels only. It would be necessary to provide a second column to show Gallons, or other fraction of the main unit of calculation.

COMMERCIAL BOOKS.

The ordinary office books of the Commercial or Selling Department of the business have not been described. It is assumed that these will be kept on departmental lines, and sufficient detail disclosed to allow of all expenses being properly allocated to the several sections of the business.

The following account, stated in barrels only, shows how an agreement is effected as between the Production Account and the Sales Account. This reconciliation would in practice show the money value in addition to the barrelage.

(*continued*).

Cellar D. Divisions.....

RACKED.—X.

WITHDRAWN. *Cr.*

Date	Reference to Transfer		Barrels	Amount	Balance		
					Barrels	Cost to date	Amount
1905				£ s d			
Jan. 22	14	By Transfer to Sales Department, at cost	160	110 0 0			
Sept. 30	..	" Sundry Transfers (detailed) ..	2,000	1,375 0 0	925	12/2·03	
Dec. 31	..	" Do.	925	562 16 3			
			3,085	£2,047 16 3			

The illustration not showing all the operations it is assumed that the "Transfers" were made from January 23 to September 30 at 13/9 per Barrel, the "cost to date" at the former date. The production, however, had been cheapened and the balance in hand may therefore be transferred, say at December 31, at 12/2·03.

ACCOUNT SHOWING RECONCILIATION OF PRODUCTION WITH THE SALES FOR THE PERIOD.

		Barrels			Barrels
1905			1905		
Jan. 1	To Stock	83	Dec. 31	By Sales (divided into classes)	1,765
Dec. 31	" Production (monthly) as debited by Brewing Department:— Rackings .. 1,877 *Less* Returns re-racked 40	1,837	"	" Transfer to Bottling Department ..	55
			"	" Special Allowances to Customers ..	5
			"	" Yard Allowance ..	10
			"	" Stock	85
		1,920			1,920

SECTION IV.

COLLIERY ACCOUNTS AND COSTINGS.

THE *pro formâ* Accounts and Cost Sheets submitted are as follow:—

I. Working Account for the four weeks ending January 27th 1906, showing the "cost" per ton of the coal raised and handed over to the Commercial Department for Sale.

II. Trading Account for same period, exhibiting particulars and expenses of selling the output, average price obtained, net profit, &c.

III. Cost Sheet for week ending January 27th 1906, showing also the cumulative figures for the previous three weeks, and agreement of Cost Sheet figures with the trading results.

WORKING ACCOUNT.

For the Four Weeks ending January 27th 1906.

To Wages :—	Tons	Cost per ton	£	s	d
Underground :— Tons.					
Coal Getting "Best" .. : :					
" "Inferior" : :					
" "Slack," &c. : :	27,500	2/9·34	3,820	0	3
Deputies, Ripping, Byework, Cheeking, Dips, &c.	..	1/0·82	1,469	0	6
Surface :—					
Labourers, Engine men, &c. &c.	..	5·12	587	1	1
		4/3·28	5,876	1	10
Workmen's Compensation ..	..	·61	70	0	9
" Pit Timber	..	2·29	263	0	6
" Horses, Harness, and Stable Account	...	·75	86	1	7
" Stores, Underground	..	·35	40	0	0
" Do. Surface	..	·42	48	0	0
" Repairs and Replacements	..	·87	100	3	1
" Do. Locomotives	..	·23	27	0	0
" Ropes, Chains, and Signals	..	·33	37	0	0
" Railways and Tramways	..	·17	20	2	7
" Coal Consumption (Colliery Engines)	..	1·66	190	0	0
" Pumping, Coal, and Stores	..	·45	52	0	0
" Surface Rents, Rates, and Taxes ..	..	·87	100	3	6
" Depreciation: Plant and Head gear	..	·86	98	0	0
" Do. Exhaustion of Mine	..	·87	100	0	7
" Royalties	..	3·67	420	0	2
	27,500	5/5·68	£7,527	14	7

By Coal Raised :—	Tons	Cost per ton	£	s	d
Colliery Consumption :—					
Charged to Winding, Pumping, Loco. Engines, &c., at a fixed price for the period	1,000	4/-	200	0	0
Trading Account :— Tons.					
Best Coal .. .. .. : :					
Brights .. .. .. : :					
Steam .. .. .. : :					
Nuts .. .. .. : :					
Cobbles .. .. .. : :					
Slack .. .. .. : :	26,500	5/6·36	7,327	14	7
	27,500	5/5·68	£7,527	14	7

TRADING

For the Four Weeks

	Tons	Per ton	£ s d
To Working Account :—			
Coal Raised, and Adjustment of Coal Stocks :—			
Stock December 31 1905 — Tons 1,000, £ s d £250 0 0			
Coal Raised January 1906 — Tons 26,500, £ s d £7,327 14 7			
Stock January 31 1906 — Tons 1,500, £ s d £375 0 0			
Best .. Brights .. Steam .. Nuts .. Cobbles .. Slack .. &c.	26,000	5/6·48	7,202 14 7
Average 5/ 5/6·36 5/-			
Management, Office, and Distribution Expenses :—			
Salaries and Commissions .. £150 0 0			
Travelling .. 175 0 0			
Stationery, Stamps, Telegrams, and Telephones .. 25 0 0			
Office Incidentals .. 25 0 0			
Bank Commission .. 10 0 0			
Professional Charges .. 20 0 0			
Bad Debts .. 20 0 0			
Allowances and Discounts .. 16 3 2	..	4·07	441 3 2
Balance, or Trading Profit for the Period ..	..	6·89	746 2 3
	26,000	6/5·44	£8,390 0 0

ACCOUNT.

ending January 27th 1906.

	Tons	Rate	£ s d	Tons	Per ton	£ s d
By Sales :—						
Best						
Brights						
Steam						
Nuts						
Cobbles						
Slack						
&c.						
				26,000	6/5·44	8,390 0 0
" Wagon Hire (Colliery Wagons) :—						
Receipts..			£290 0 0			
Less Maintenance		£30 0 0				
" Interest under Leases, &c. ..		235 0 0				
			265 0 0			
Credited direct to Profit and Loss Account			£25 0 0			
				26,000	6/5·44	£8,390 0 0

COST SHEET, Week ending January 27th 1906, and TOTALS for the previous Weeks.

	Cost Sheet, Week ending Jan. 27th 1906					Total, 3 Weeks to Jan. 20th 1906			
	6,500 tons. 5½ days					21,000 tons			
	Cost per ton	£	s	d		Cost per ton	£	s	d
I.—UNDERGROUND WAGES:—									
Coal Getting	2/4·69	777	3	10		..	2,674	2	4
Do. Machine	2·19	59	3	10		..	309	10	0
Deputies	1·49	40	10	1		..	85	3	6
Ripping	1·28	34	12	1		..	115	1	3
Cheeking	·20	5	8	6		..	51	8	6
Byeways	1·53	41	10	8		..	84	6	6
Roads and Windways	·74	19	17	5		..	85	10	3
Heading New Roads	2·97	80	12	2		..	170	10	6
Faults	2·19	59	11	2		..	121	3	5
Haulage	3·54	95	18	0		..	196	6	11
Onsetting	·58	15	14	10		..	35	3	9
Sundries	1·49	40	0	0		..	90	10	6
		£1,270	2	7			£4,018	17	5
Cost per ton ..	3/10·89					3/9·93			
II.—SURFACE WAGES:—									
Labourers	1·22	32	15	9		..	160	10	3
Carpenters	·56	15	8	7		..	55	3	0
Smiths	·38	10	6	8		..	40	3	6
Fitters	·41	11	3	2		..	39	6	3
Pumping	·19	5	2	2		..	15	3	6
Winding and Fans	·97	26	9	8		..	59	10	6
Weigh Clerks, &c.	·72	19	5	1		..	63	2	9
Sundries	·26	6	19	7		..	20	10	6
Lights and Signals	·06	1	12	0		..	4	7	1
		£129	2	8			£457	17	4
Cost per ton ..	4·77					5·23			
Workmen's Compensation	·13	3	10	0		·76	66	10	0
Total Cost, Labour, per ton ..	4/3·79					4/3·92			
III.—STORES CONSUMPTION, MAINTENANCE, AND GENERAL WORKING EXPENSES:—									
Pit Timber	2·22	60	0	0		..	205	6	9
Horses, Harness, and Stable	·79	21	10	3		..	70	10	3
Stores, Underground	·38	10	5	0		..	30	15	0
Do. Surface	·44	12	0	6		..	36	0	0
Repairs and Replacements	·94	25	10	0		..	65	10	6
Do. Locomotives	·26	7	0	0		..	20	6	9
Ropes, Chains, and Signals	·29	8	0	0		..	29	10	3
Railways and Tramways	·16	4	10	0		..	16	3	5
Coal Consumption (Colliery Engines) ..	1·49	40	0	0		..	150	0	0
Pumping Coal and Stores	·50	13	11	6		..	39	0	0
Surface Rents and Rates	·79	20	10	6		..	80	10	6
Depreciation: Plant and Head Gear ..	·88	24	0	0		..	74	0	0
Do. Exhaustion of Mine ..	·73	20	0	0		..	80	0	7
Royalties	3·69	100	0	0		..	320	0	0
		£366	17	9			£1,217	14	0
Cost per ton ..	1/1 56					1/1·91			
IV.—MANAGEMENT, OFFICE, AND DISTRIBUTION:—									
Salaries and Commission	1·40	38	0	0		..	112	10	0
Travelling	1·58	42	10	3		..	140	0	0
Office Expenses	·68	18	10	6		..	62	19	3
Bad Debts	·36	10	0	0		..	15	0	0
Allowances and Discounts	·18	5	0	0		..	13	0	0
		£114	0	9			£343	9	3
Cost per ton ..	4·20					3 93			
Total Cost per ton ..	5/9·55					5/9·76			
		£1,883	13	9			£6,104	8	0

COST SHEET—(*continued*).

TOTALS for the 4 Weeks ending January 27th 1906.

	Week ending January 27th 1906		Total for 3 Weeks to January 20th 1906		Total for 4 Weeks		
	6,500 tons raised		21,000 tons raised		27,500 tons raised		
	Per ton	£ s d	Per ton	£ s d	Tons	Per ton	£ s d
Brought forward	5/9·55	1,883 13 9	5/9·76	6,104 8 0			
				1,883 13 9			
					27,500	5/9·71	7,988 1 9
Deduct:—							
Colliery's own Tonnage and price debited in Costings..					1,000	4/-	200 0 0
Tonnage at Cost					26,500	5/10·53	7,788 1 9
Disposed of as follows:—							
		Tons	Per ton	£ s d	£ s d		
Added to Stock		500	5/-	125 0 0			
Loss on Stock Price, below the average Price		..	10·53	21 19 0			
					146 19 0		
Sales		26,000	6/5·44	..	8,390 0 0		
							8,536 19 0
		26,500					
Profit as per Costings for Month (see below)							£748 17 3

	£ s d	£ s d
Profit as per the Costings	748 17 3	
Do. do. Trading Account for same period	746 2 5	
Balance, short ..		2 15 0
AGREEMENT.		
Loss on Stock, as shown	21 19 0	
Gain on the Costings arising mainly through over-estimating in the weekly consumption of stores	19 4 0	
		2 15 0

COLLIERY ACCOUNTS AND COSTINGS.

This short section on Colliery Accounts is devoted to the consideration of the Working and Trading Accounts for a period, and the agreement of their results with the Weekly Cost Sheets.

The period taken is one month, and the accounts may be regarded as an illustration of the Annual Accounts on the one hand, and the four weeks' Cost Sheets of the whole year's costings on the other.

In the *pro formâ* Cost Sheets shown in the preceding pages the following are the main divisions observed in compiling the costs:—

Working Account.—

I. Underground—

Coal Getting: Direct Wages, Oncost, or Indirect Wages.

II. Surface—

Oncost: Indirect Wages, Colliery Working Expenses.

Trading Account.—

III. Management and Selling Expenses.

It would be possible to subdivide the Weekly Cost Sheet to show the comparative net results of raising the different classes of coal. The colliers are paid at differing rates, according to the class and commercial value of the mineral raised. For example, say:—

Best	2s.
Inferior	1s.
Slack	5d.

The tonnage in each class might be separately recorded and costed, and set against the average realised prices of each division. It is found, however, that the average cost, based on the total "get," is sufficient to afford an accurate showing of the weekly profit or loss. In order to show and record the causes of unusual fluctuations in the weekly profit, a subsidiary Cost Sheet may be kept, in which would be exhibited the comparative results under the several classes. In this case the oncost, above and below ground, may be taken from the Cost Sheet proper in totals, the sub-cost Cost Sheets showing the main divisions of cost only.

The Working and Trading Accounts submitted suggest how the subdivisions may be introduced. Figures are not shown, as the general Cost Sheet is the one primarily under consideration.

Oncosting.—

There are different methods of oncosting the general management and other indirect expenses in the Weekly Sheet. One is to base these charges on the actual figures of the last financial year, and this course has simplicity to recommend it. The Cost Sheets here submitted are supposed to be taken on the actual expenses as incurred from week to week. The major portion of the management expense may be safely divided into a definite weekly burden to be carried. The heads of the minor portion are capable of absolute determination once a month, and the slight variation may be accurately adjusted within that limited time. Working backwards through the other divisions of indirect expenses, it will be found that, provided every account book in the general office—from the Purchases Allocation to the Petty Cash—is recording its data under the settled Cost Sheet headings (and this must be assumed), there is little difficulty in arriving at the actual weekly cost under each of these heads.

The consumption of Stores, Pit Timber, &c., may be arrived at by the purchase debits, or, where large and varying stocks are the rule, by the calculated cost of the Timber, Girders, &c., sent down the pit. In the latter case controlling Stock Accounts will be kept.

Suspense Accounts.—

At times it is necessary to incur a heavy outlay, which, however, cannot prudently be regarded as capital expended, and has therefore to be debited against the current working and included in the Weekly Cost Sheet. It may be a boiler has been renewed (say £500)—this class of expense is affected by the system of renewals and replacements obtaining (see Depreciation)—or some special current expenditure under ground, *e.g.*, extension of tramway, say £750. The former item would mean £10 per week for a year on the Cost Sheet, and a Costings Suspense Account would show the diminishing sum, week by week, which has yet to be charged.

In the latter case, if the expenditure was coming through the labour bill weekly, it might conveniently be allowed to lie where it fell; but were it in the form of a heavy purchase or contract for timber, or iron, it should be placed to a Costings Suspense Account, and distributed weekly over the year or period in which it was desired to see it extinguished. Were this period a year, the charge would be £15 per week.

Stocks.—

The weekly adjustment of the stocks of coal on hand, which in many collieries vary to no appreciable extent, as far as the costings are concerned, may be made on an average basis for the month, as in the case illustrated, or they may be taken on the actual raising "cost" figures of each class, where the Sub-cost

Sheets are kept. It is well to keep the stock price on a low average, and adjust the loss for the week, if necessary, as shown in the illustration.

Expenses on "Get" or Sales.

Wages and all Colliery Working Expenses, including Depreciation, are based on the tonnage raised. The expenses of the commercial management and distribution are more correctly based on the weekly sales tonnage. As has been pointed out, the stock does not as a rule vary materially. If there is not a fairly ready market for the coal it will not pay to bring it to the surface. In the *pro formâ* Cost Sheet given herewith the management expenses are taken on the "get," in same manner as the actual colliery expenses of raising the mineral, it being more convenient for clerical calculations to adhere to the uniform tonnage. In the Trading Account, however, the former are calculated on the sales tonnage, and in reconciling the respective results at the end of the period the variation is very slight, the stocks not varying to any appreciable extent.

Tonnage: "Get" and Sales.

At some pits it occasionally happens that the actual tonnage raised—the "get," or basis of wages paid—affords a beneficial margin to the Commercial Department, and this sometimes after the latter have made a liberal allowance to the buyer, by railway truck, for wastage and loss in transportation. On the other hand, at times there are shortages. These contingencies are not provided for in the present illustrations, and, in fact, they are outside the scope of any scheme of definite calculation.

In the former case the result is gain, and, as there are outside checks imposed, these should operate to keep the margin within reasonable limits. The shortage should be traced and remedied immediately.

Variations in the weights of this nature are direct and immediate, their effect on the sensitive costings being very marked. For example:—

	Tons	Average	£
Wages and all Expenses paid on a "Get" of	1,000	6/-	300
Sales for an equal period (Stocks equal) ..	1,000	6/6	325
6d. per ton profit, and no margin on tonnage			£25

Again:—

	Tons	Average	£	s	d
Wages, &c., as above	1,000	6/-	300	0	0
Sales for same period (Stocks again equal)	1,030	6/6	334	15	0
Gain	30				
6d. per ton profit, and 30 tons gain at 6/6 per ton ..			£34	15	0

Depreciation.—

In the accounts with which this section opens the depreciation is set out under these headings, viz.:—

Plant and Headgear.

Exhaustion of Mine.

There is no particular reason for this division. The former is, however, the actual "wear and tear" provision which all concerns endeavour to make in some way and to some extent. The latter, on the other hand, is practically a writing down of the fixed assets represented by Purchase-price, Leases, Cost of Sinking Shafts, Underground Tramways, &c., so that these may all gradually, and in direct ratio to the process of exhaustion of mineral that is taking place, disappear from the Balance Sheet. At the expiry of the leases, or the exhaustion of the coal-field, or upon the abandonment of any particular shaft, there should be no "assets" representing this class of capital outlay appearing in the accounts.

The capital of the business, were it a continuing one, would then be represented by fresh or recent leases and sinkings, the original outlay having been recouped out of profits.

All replacements of timber, girders, &c., taking place from year to year would, of course, be charged to revenue as they were made.

The plant and general headgear would have a residual or break-up value, and this must be allowed for in the original basis and calculation at the time the rate of depreciation, per ton, is determined.

In arriving at this, at the outset regard must be had to the survey and measurement of the mining manager, in consultation with the consulting engineer, and the following may be taken as an illustration of the calculation:—

Area of Coalfield which it is estimated can be worked within the limits of the leases, as per Engineers' Certificate (one million tons)							Tons 1,000,000
Capital Outlay on acquiring the leases, cost of sinking shafts, laying underground tramways, &c., and electric and general plant installations ..	£6,579	0	0				
Less Residual value, say 5 per cent.	329	0	0				
				£6,250	0	0	
Or, a charge against every ton of coal, as and when raised, of 1·50d. per ton							1·50d.

In the foregoing all the plant is included and depreciated directly on the tonnage basis, it being assumed that the original equipment will be maintained out of revenue, irrespective of time considerations. The surface plant and machinery may, however, be depreciated on the ordinary basis, a percentage being fixed on the probable length of life of the varying classes

of machinery, the depreciation so arrived at being debited in the costings—so much per ton—in addition to the provision for exhaustion of mineral.

Where the colliery own workmen's cottages, and other properties which are dependent for their tangible value upon the existence of the mine as a centre of life, the depreciation and ultimate probable value must be considered, and the estimated loss covered in the "cost per ton."

Colliery Cost Sheets.—

The Wages Recapitulation and Weekly Cost Sheets are usually ruled on suitable paper, showing in horizontal columns the detailed headings and subdivisions of cost, and perpendicularly in such a manner as to exhibit the increasing aggregate until the end of a quarter is reached, when a new sheet may be commenced, bringing forward the averages.

The illustrative Cost Sheet (pp. 118, 119) is not ruled on this principle, it being more convenient in book form to set it out vertically.

SECTION V.

STOCKTAKING.

It generally happens that the usual custom of taking stock "at cost or under" causes trouble and confusion, and this is more apparent when the necessity arises for agreeing the "costing" results with those shown by the Financial Accounts of the business. The following are points for consideration in determining the prices at which stock is to be taken:—

Manufactured Goods.—

The primary aim is to get at the *actual cost* of the article, and it follows, therefore, that all the elements of productive cost must be included. As an illustration, let the following be taken as representing the component parts of an article to be priced:—

		£	s	d
1	Raw Material .. } .. Direct Cost ..	5	0	0
2	Productive Labour } .. Direct Cost ..	6	0	0
3	Departmental or Indirect Cost (of Production), *e.g.*: Foremen's Wages, Rent, Taxes, Insurance, Coal and Power, Light, Heat, Depreciation, and Maintenance of Works and Machinery, 50 per cent on Labour..	3	0	0
4	Indirect Expenses:— Management Salaries: Officers and Directors, Office and Warehouse Expenses, Financing and Distribution Expenses, Bad Debts Reserve: (Average on the experience of past years), 10 per cent. on Selling price	2	0	0
5	Profit	4	0	0
6	Selling Price	£20	0	0

The first three of the above divisions represent the factory cost. Adding the fourth, or indirect expenses, the "cost" is reached—that is, the total cost of the article produced, but not necessarily the price for stocktaking purposes.

It is necessary to see what goes to make up No. 4, or the indirect expenses. Should it be all distribution expenses no proportion must be included; if, on the other hand, it can be divided into buying and manufacturing, as distinguished from *selling*, then take the proportion represented by the former and transfer this to No. 3 account, dealing with it as a shop expense in future. Where the indirect expenses are inseparable, stop; for stocktaking ends at No. 3, which is the fair "shop cost."

Raw Material.—

Raw material should be taken at cost price (invoice price), plus carriage and buying expenses (*e.g.*, Commission, Brokerage, &c., if any), the trade discounts being deducted.

The cash discounts are reserved as a counting-house matter, and need not be allowed for in the calculations.

Work in Progress.—

Material as above.

Labour of various processes to the point the "work" has reached.

Proportion of expenses—*i.e.*, Shop Expenses, the work in progress being taken down in separate columns, or books; the percentage to cover Shop Expenses may be added in one item at the end.

Finished Stock.—

On the same lines as in the case of work in progress, but there are further considerations here which should be kept well in view. Take, for example, finished stock not on order. Having

arrived at the cost price as already described, and completed the Stock Sheets, how may these be tested and verified?

Let the selling price of the goods be taken, and allowances made to provide for the following:—

(*a*) Agents' Commission.

(*b*) Carriage (outwards, if any), Packing, and Delivery.

(*c*) Usual Discount.

(*d*) Possible Claims, Damages, &c., percentage.

(*e*) Loss on "Returns," percentage.

(*f*) Interest for term of usual credit where discount terms do not cover.

(*g*) Average loss by Bad Debts (experience of, say, five years).

Further, regard must be had to these contingencies, viz.:—

(*h*) Interest on the probable term the goods will remain in stock.

(*i*) Tendency to depreciate and become shop-worn, or "last season's."

(*j*) Office and Selling Expenses (*e.g.*, Travelling Expenses), also a fair Trading Profit for next year.

Having allowed for all these factors, it should now be possible to see how the "cost" figures compare with those arrived at on this "working-back" system. If there is not a fair "margin" of profit to next year it will be necessary to make a special allowance or deduction from the stock as completed (and as taken at cost), inasmuch as it is now found practically that over-stocking has taken place, and next year must not be called upon to bear the burden of this year's mismanagement and miscalculation.

In the case of finished stock, any commodity ready for the market, which commands a ready sale at a regular price, there is not the same occasion for taking into stock at less than cost. The ales in stock at a brewery, for example, and which are already for all practical purposes as good as sold should not be taken into account at any figure less than cost.

Purchased Goods or Accessories.—Goods on which there is no labour expended should be taken separately at purchase-price (less trade discount), plus carriage, and it is well to have separate columns in the Purchases Allocation Book for this class of goods.

Market Prices.—In taking stock it is, of course, necessary to have due regard to the market fluctuations. Material may have been bought or contracted for on a "falling market," and the prices at stocktaking must therefore be discounted accordingly. This, however, should not be allowed to interfere with the cost system, or affect the cost of production, as the actual purchase-prices will be accumulated in due course and the average obtained. A specific reserve must be made for Balance Sheet purposes, and this will be placed to the debit of the manufacturing or trading in the form of a Suspense Account. In the case of a "rising market," no notice should be taken of the accretion in value. Not being realised it is probably not available as profit, and there is no object in creating a "reserve" for this fluctuation.

Secret Reserves.—It has been found sometimes that secret reserves have been created by means of writing down the stock quantities and values. This practice may receive an impetus from the fact that the principle of an internal Reserve Fund is now practically approved by the Courts (although an auditor of a company registered under the Companies Acts may find difficulty in determining his duty as between the "Articles" and the

"Act"), and, viewed from one point, it is certainly more prudent to reduce rather than inflate the stock-in-trade, or any other asset. On the other hand, the method is liable to abuse in many ways.

The stocks should be taken on the settled basis, and quite irrespective of any knowledge the management may have of the good or bad results of the year's trade as gleaned from the Cost Sheets. The whole work of the Accountancy Department of the business for the year is rendered futile if the stock is not taken in a business-like manner, as the accounts do not disclose the true state of affairs.

Changes in Management.—Changes in management, especially when these take place near the close of a financial year, sometimes mean the wholesale reduction in stocktaking prices and the "scrapping" of much "work in progress." There are sometimes good reasons for this course, and on occasion there is justification for a less favourable inference.

Basis.—From the cost accountant's view-point there must be no playing "fast and loose" with the stocks. They must be taken on sound principles, if accounts and records are to be at once complete and useful.

An important point in stocktaking matters is that the stock be taken always on the same basis, provided, of course, it is a reasonably correct one, because otherwise the true results of the manufacturing are not disclosed. A bad basis, if it were consistently followed, would probably afford more correct results as between periods than would a scientifically correct survey, if the latter were not rigidly adhered to.

SECTION VI.

CARDS, LOOSE-LEAF LEDGERS, LOOSE SHEETS, AND DETACHABLE RECORDS GENERALLY.

Business concerns of all kinds are now employing, in more or less complete form, Cards and Loose Forms and Sheets for the purpose of recording and tabulating their business data, it being found that their readiness of reference and handling generally more than compensate for any incidental inconvenience that may arise on occasion through the misplacing of a loose recording document.

Bound books, whilst undoubtedly affording a greater sense of security, being less portable in themselves and their contents less adaptable to speedy treatment for specialised data at short intervals, or, it may be, at a minute's notice, are gradually giving place to more mobile forms of record.

Several lectures on Cards and Card Systems have appeared in the columns of *The Accountant* and elsewhere, some of them, apparently, delivered by experts in the general production and manufacture of suitable furniture and office equipment—an important feature in the economical and useful working of cards being proper filing machinery—and the information thus available may with advantage be considered in detail by those contemplating the introduction of Card Systems. Others, again, have evidently been delivered by accountants conversant with the subject, they having either introduced or completed systems adapted to the businesses described in the lectures.

The writer does not propose, therefore, to traverse this ground, and attempt to discuss or describe any particular system of cards, believing that there is no such thing as a complete method of cost or general accounting that can be with profit conducted solely, or even on the whole, largely by means of cards.

It is believed, however, that having once outlined in the mind a full system of factory accounting in connection with, let it be assumed, an engineering shop, much of the detail can be advantageously gathered together and marshalled by loose records of one kind and another, as has always been done in such shops.

Cards.—

For example the, Time Recording Clocks and "In" and "Out" Boards for the workmen, Job Tickets for specified work, Daily Tickets for workmen employed away from works on sundry jobs are essentially cases for cards, properly controlled under a suitable issuing system.

Loose-Leaf Ledgers.—

On the other hand, the grouping of the time and piece detail can be much better conducted by means of loose sheets consecutively numbered, and controlled by a responsible person, and where the records are important ultimately bound in a Locking Ledger, completed contracts or subdivisions of contracts being transferred to a Ledger set apart for such and only required for occasional reference in the future.

Books.—

The ordinary bound book also plays its part. If it is to be really serviceable, however, and hold its own even in certain directions with the Loose-leaf Ledger, it must be bound in such a manner as to provide at once a flat and convenient surface from one side of the page to the other on its being opened at any page.

Let it be assumed that this book is the Cost Ledger, or, it may be the Nominal Ledger, in the general office of an engineering works, according to the system followed.

Controlling Accounts of all main contracts, if large enough to justify this course, Production, or, it may be, Materials Accounts, Manufactured Articles, Divisions of Stores, &c., would be opened in this book. The book will either be self-contained, carrying its own proof of clerical accuracy, or part of a system, and there is no reason why these accounts should not continue to be kept within the boards of an ordinary Ledger.

Having some such system of controlling the loose records, these may be multiplied at will and as the requirements of the business disclose need.

The bound book, however, should not be overloaded with detail, monthly or other period totals being all that is required. Immediately the necessity for compiling statistics, preparing comparisons, individual results, &c., presents itself it must be to the properly arranged, indexed, and "cross referenced" cards and sheets that the cost accountant turns.

An engineering shop is only one of the many industries in which loose records may be usefully and safely employed. The following are examples of other businesses, or sections of businesses, in which the bookkeeping readily adapts itself to such treatment.

Travellers.—

In a merchant's business, where the turnover is practically maintained through the travellers, each traveller has his round of towns and customers, and has allocated to himself by his House a clerk, whose main duty is to see that the traveller is properly and regularly advised. Also that his customers are duly apprised of his approaching visit. Cards, probably better than any other records, will allow of convenient and ready arrangement.

They would be arranged in towns or districts, also alphabetically under each; show dates of former visits, trade done at each, yearly trade, &c.

The traveller's special reports as received would be epitomised and shown on the cards as against the dates. Cards would be opened, and kept apart for the time being, for prospective customers called upon, and the traveller's report of the case noted for future reference and advice. Further, it would show by some mark or letter, or arranged code, the class of customer, his credit limit, particulars of statements rendered, &c.

Where the traveller was carrying several lines, and pushing certain new ones, it would be well to have sub-cards for special data, these to run in concurrent order with the main cards.

Railway Rolling Stock.—

A concern building and maintaining railway wagons finds the use of cards very convenient, thus:—

Wagons Built.—A general manufacturing record under the consecutive number of the wagons, the card number and the wagon number being the same; this card to show the standard or other specification of the truck, date built, date sold, buyer's name, cost price, sale price, &c., and be used for general reference.

Note.—Probably an ordinary Wagon Register (in book form), a line to each wagon, would be more practicable, seeing that the occasions for reference in this case are not numerous.

Maintenance of Wagons under Contract.—A card for each wagon, with a controlling card under the name of the owner, the latter to show the numbers of all the wagons under a contract, and also give particulars of quarterly payments (C. B. folio), and also a reference to Maintenance Cost Ledger showing the cost of upkeep as against the contract price. The individual wagon card to show history of wagon as regards repairs, *e.g.*, Where working, Date and where stopped, Nature of

damage, Cost Ledger reference as to repair, Particulars of extraordinary repairs or chargeable work.

As Factors: Finding Work for the Wagons.—A card for the individual wagon, showing its earnings. The wagons are usually working in blocks, in which case a card for the block may be used. The information recorded would be as follows:—Owner, Rate of commission, Hirer, Rate of earnings, Where running, Particulars when standing idle and where, Reference to earnings received and handed over. In order to facilitate the immediate location of a card, from either point of view, owner's or hirer's, a system of cross-reference should be adopted.

Acquiring Rolling Stock under Deferred Payment Leases.—The stock being run on a basis to allow of the earnings meeting the instalments of capital and interest.

A card for each wagon, or block, as found convenient, showing Name of Finance Company and Date of Lease, Wagon number, Purchase-price, Rate per cent., Quarterly instalment (C. B. folio), columns showing division of this instalment as between capital and interest. The card to be divided into two sections, the foregoing data being recorded on the left-hand side, or upper half of the card, if preferred, the right-hand side, or lower half, being devoted to showing the following information:—Where working and Hirer, Quarterly earnings, Quarterly maintenance, Depreciation, Balance (cash received over cash paid, or *vice versâ*), Balance, Revenue (earnings over Interest, Maintenance, and Depreciation, or *vice versâ*).

Note.—In the case of a business employing cards for, say, four quite distinct purposes, the cards should be in distinguishing colours, *e.g.*:—

Wagons built	White.
Maintenance	Primrose.
Factors	Green.
Leases	Pink.

Weighing Machines.—

Firms building weighing machines, weigh bridges, &c., for railway wagons, horse vehicles, and other traffic might employ the cards in recording their contracts to keep the machines in good repair and up to the standard of the "Weights and Measures" requirements. The cards would be on the lines of those described under "Maintenance" (Rolling Stock).

Accountant's Office.—

The principal, or managing clerk, has a set of cards on his table to assist him in assuring the punctual carrying out of the regular audits. Each audit has its own card, which is headed to show Client's name, Address, Audit clerk in charge, Junior clerk, short particulars and any special instructions (*e.g.*, attend to income-tax returns), whether monthly, quarterly, or annually (different tints of paper to be used), reference to office cabinet where papers are kept. The card is ruled to show dates of taking up and completing the periodical audit and the initials of the clerk in charge, notes as to why work delayed or postponed, Final Accounts certified, &c.

A duplicate card should be kept in the audit portfolio, or, better still, each audit clerk should have the duplicate cards of his own audits in a convenient stand or drawer in his own room.

Pianoforte Tuners.—

A musical instrument dealer may employ cards as records of his tuning contracts (pianos, organs, &c.) on somewhat the same lines as described in the foregoing paragraphs. The main, or office, card being alphabetically arranged (quarterly or other period being indicated by a colour), and showing customer's Name, Address, Date of contract, Tuner's name, Fee, and Payment (C. B. folio). The duplicate card is in the tuner's possession, and in addition to Name, Address, Date of tuning, Note of special repairs, &c., it should have a space for the

signature of the customer, this being obtained at the time the work is performed. A music seller's business would also use cards for the purpose of recording his hire-purchase operations, one for each instrument, but this class of trade is fully described in the next paragraph.

Hire-Purchase Businesses.—

Firms distributing goods under any system of deferred payment, or hire-purchase, and especially where the articles are relatively of small value (as distinguished from expensive machinery, now frequently acquired under this system, for example), and the customers numerous, find that cards may very conveniently be used for their accounts with the hirers or customers. Businesses trading in household furniture, cycles, sewing machines, pianos, &c., may be instanced. The cards in this case become Ledger Accounts, and as there must be in this case an adequate check upon the cash passing, the introduction of such a system must carry with it some controlling records linked to the fuller system of office accounts and bookkeeping.

Two examples may be taken. (1) That of a business having one shop only. (2) That of a large distributing firm having, say, fifty branches.

(1) *One Shop* (1,000 *Accounts*).—There is a filing cabinet, with five drawers or trays indexed say as under:—

A to E.
F to K.
L to O.
P to T.
U to Z.

The order having been booked, and the agreement signed, the goods are delivered and entered in the Day Book in the usual course. This Day Book is added up weekly and the total posted twice: Debited to A to E cabinet (or Card Ledger) and credited to Sales. Should the business books be kept departmentally the Sales Account will show the subdivision. Goods returned will

pass through the Returns Day Book, and this total will also be posted twice: Credited to A to E and debited to Sales. The cards will be ruled after the manner of a Hire-Purchase Ledger, more space being allowed to the instalments side of the book, alphabetically arranged under a five vowel or other system of easy reference, and posted up from the Day Book, Returns Book, and Cash Book. The Instalments Cash Book total for the week will be posted twice: Debited to Bank and credited to A to E cabinet. At this point it may be well to describe the method of dividing the cash instalments as between the cabinets or drawers. Each of the five divisions will have its own colour of card, the customer's card or book conforming thereto. The cashier, as he enters the payment on the customer's card, makes a corresponding entry in the Instalments Cash Book (a Cash Desk Book), extending the amount into one of the five columns headed A to E, F to K, &c. The individual cash totals are thus available upon the columns being added up on the Monday morning. The total column will, of course, be added and balanced with the cash at the close of each day. The A to E Account in the Office Ledger will thus show on its being posted up for the month as follows:—

NOMINAL ACCOUNT IN OFFICE LEDGER.

Dr. A. TO E. CABINET. *Cr.*

			Day Book folio		Cash and Returns Books folios	Returns	Cash	Total
1906		£ s d		1906		£ s d	£ s d	£ s d
Jan. 1	To Balance ..	560 3 9		Jan. 7	...	..	200 3 6	
7	" Goods out	150 3 6		"	..	10 6 11		
14	" " ..	70 10 9		14	..	..	80 6 11	
21	" " ..	230 3 11		"	..	20 3 9		
28	" " ..	160 0 0		21	..	..	150 3 6	
				"	..	6 3 8		
				28	..	..	90 3 10	
				"	..	4 15 9		
								562 7 10
						Balance ..		608 14 1
		£1,171 1 11						£1,171 1 11
Jan. 28	To Balance ..	608 14 1						

The balance of £608 14s. 1d. represents the aggregate balances, or amounts due from customers, and should agree with a list of balances extracted from the cards at stock-taking or other occasion. The cards have to be frequently scrutinised, in order to issue reminders to those in arrear with their instalments, and it should be someone's duty to see (one time the manager, another time the principal, occasionally the auditor) that the cards agree with the Check Account in the Office Ledger. The suggested check does not involve so much time, as it is sufficient to take one cabinet at a time. No set system or sequence must be observed. On the contrary, the less apparent the method and object of scrutiny the fuller and more efficient the check.

Now, supposing the balances on the cards do not agree with the Check Account at, say, stocktaking. The explanation lies in one or two possible directions—errors in postings or additions, or a more serious irregularity, in which case a card has been abstracted for a wrongful purpose. Clerical errors must be found in the ordinary way by checking the work. The missing card must also be located by going over the section in which the discrepancy occurs. Once located, it is necessary to call in the customer's card (or preferably to take a copy of the card at the time of the next payment) and re-write a fresh card for the cabinet. The consecutive number in this case would have to be adjusted. A new card could, of course, be compiled from the original entries, but this would be a waste of time.

This illustration is fully set out as affording a key to the introduction of cards which embrace cash records in their operations, and where it is absolutely essential from preventive as well as detective reasons to impose an efficient check.

(2) *Fifty Branches* (500 *to* 2,000 *Accounts at each*).—A Weekly Balance Sheet or Return is forwarded to the Head Office every Monday morning, and this return shows the sales and returns and the instalments received in detail.

The filing and posting is simply an extension of the system described under the "one shop" business. A cabinet (or section) is set apart for each shop, and the subdivision of a shop is made according to the number of customers on the books. There is this main difference, however, the office work is being done from the Shop Weekly Return, which sheet is readily divided, being printed and perforated with this in view, into four sheets as follows:—

(1) *Balance Sheet,* showing total cash taken, expenses paid, and balance to bank. This sheet is for the Accountant's (Cashier's) Department only.

(2) *Business Done.*—Sales in detail, arranged alphabetically (or in card consecutive order).

(3) *Returns.*—In like manner.

(4) *Instalments Received.*—In like manner.

These four sheets are numbered and become bound books—Cash Book and other account books—by means of an adjustable binding appliance. Space is left on the sheet for the purpose. In order to secure a periodical total as in the case of a Day Book, the sheets not always being conveniently ruled or written up for this purpose, each sheet total is recorded on a Summary Sheet at the front of the binder, the Weekly Sheet number and amount only being required.

It is understood, of course, that the branch manager has his own cards or Ledger for shop purposes.

An alternative system in connection with the Head Office of a business of this class is to have ordinary Ledgers—one or more for each shop, as required—and to have the Weekly Sheets from the branches so marshalled in their detail as to allow of a ready posting from the sheets (both goods and cash), line by line, to the Ledger pages in complete sequence. This method

of posting is so expeditious that it becomes a question whether it is not quite as time-saving as the cards. A Loose-leaf Ledger would allow, of course, of the removal of dormant accounts in the same way as the cards may be transferred to the "dead" section of the drawer. The cards, however, on the whole appear to allow of the most ready handling for general purposes.

Bicycle Company with Depôts.—

A cycle manufacturing company, with depôts in all the larger towns, is another instance where the cards and sheets might be employed on the lines just described.

In this case, however, it would not be necessary to provide for the bulk of the business on deferred payment lines, and the cards, forms, sheets, &c., would have to be prepared accordingly. There would, however, probably be sufficient account-keeping arising out of monthly payments over a year or eighteen months, or thereabouts, to justify the adoption of these clerical labour-saving devices.

Brewery: Casks, Cases, and Bottles.—

Cards may be advantageously used in breweries for the purpose of recording the movements of the casks. Each card denotes the number on the cask, and the varying sizes or colours of the cards, the capacity of the cask—54 G, 36 G. 18 G., &c. &c.

The cards represented by casks at the brewery refilling, under cooperage, or standing as full casks in the cellars, should all for the time being be in separate sections of the card cabinet. As the clerk marks off the casks just brought home by a drayman, he places the same in the brewery or "home" section of the cabinet. The cards, in addition to showing the date of purchase or manufacture of cask, customers' names, date of the casks' inwards and outwards movements, also record dates and nature of all special cooperage, the cask being practically renewed sometimes.

Town breweries doing a large "bottled trade" find it necessary to keep a check on their cases of bottles. Where the brewery charges these up to the customers, crediting at same rates on return, the cases may be said to look after themselves, but this course is not always appreciated by customers and free houses.

A simple system of cards, working on the same lines in the main as those kept for the barrels, may be introduced. A card would represent a case containing one dozen half-pint bottles, the cards differing in sizes to represent one dozen "halfs," two dozen pints, &c. &c.

Note.—Anyone perusing these observations on cask records, and being desirous of pursuing the study of the science of "index and reference" as applied to casks, should refer to Harris's "Brewers' Accounts," where the systems obtaining in the Guinness and other large breweries are explained and discussed.

Share and Stock Registers.—

Turning from the manufacturing and trading side of business life to the records kept on behalf of the capitalist whose capital is nominally represented by stocks and shares, it is found that the cards are also usefully employed in this domain. Share, Stock, Debenture, &c., Registers may be kept by means of cards ruled in suitable manner. Whilst the capital is being called up fuller details are required; but immediately the capital, or any particular issue thereof, has been fully paid, the cards will work very conveniently.

The Transfer Register allows of a double posting: Debit to the buyer or transferee, credit to the seller or transferor. These entries are posted up to the cards after each board meeting. The filing cabinet will be arranged according to the number of stockholders, and the cards alphabetically placed under a good

system of "vowel" or "consonant" division for convenience. The card will, of course, show Holder's name, address, "Dividends to be sent to ——," Dates of becoming and ceasing to be a member, Transfer Register Reference (In and Out), &c. &c., and on the right-hand side of the card the "Balance" of stock held.

All closed accounts should be transferred to an alphabetically-arranged "closed" section of the cabinet. The active cards must be agreed with the respective Capital Accounts in the Private Ledger from time to time to ensure accuracy, and a quick method of doing this is by employing a Burroughs adding machine. On one occasion the "Ordinary" stock is taken, next time the "Deferred Ordinary," another time the "Second Preference," and so on.

Note.—The statutory requirements of certain companies include the provision of a Share Register, which has to be sealed at the proprietors' general meetings. This is not the class of company contemplated in these notes on cards, but it is conceivable that a simple form of register might be kept, in order to comply with the statute without seriously duplicating the work.

General Warehousemen: Departments—Day Books *v.* Cards, &c.—

Sometimes attempts are made to discard the numerous Sales Day Books required in a large general warehousemen business, and loose records of one kind or another are substituted. Cards do not seem, however, to readily adapt themselves to this class of work. It requires something more in the nature of the "cheque" or "credit slip," from which the bank clerk posts his Ledger.

The following system will meet the case after adjustments to the special features of the business have been made.

Let the invoice to the customer be written in a manifold book, and the second copy become the "slip" for the Ledger Department. Where objections are held to the "manifold" method let the invoice, an ordinary single sheet, have a detachable slip, with simply Date, Name, Amount, Discount, Terms, Reference to Order Book.

The departmental invoice clerk fills in the three or four words at the time he writes out the full invoice, and the invoices pass on to another clerk for despatch. This clerk, before giving them out to the "stamp clerk," records the totals in a Summary Book, Name, Reference to Order Book, Net amount, and Department (under columnar heads). He also stamps with a consecutive triplicate numbering machine the invoice, the slip, and the line in his book. He then passes the batch of slips on to the Ledger Department.

When details of goods despatched are required, reference must be made to the "Orders" Book.

In the same way the "Purchases" Invoices may be posted direct to the Bought Ledger, where it has been decided not to use Day Books on account of the clerical work involved. The invoices, as they are received, must be consecutively numbered and registered in a simple fashion, the Invoice Register showing only No., Date, Supplier's Name, Amount, with a subdivision of the "Amount" column over the departments, say seven, headed A, B, C, D, E, F, G. After the invoices are thus registered they will be passed on to the departmental men responsible for their accuracy, and having been certified as to quantity, price, &c., will then be handed to the Ledger clerks to post direct to the Supplier's Account in the Ledger. The Ledger clerks have Ledger notes as to terms and discounts, and from these check the monthly statements. The invoices, having been alphabetically filed, are readily attached to the statement on

"pay day," and produced to the principal, together with the cheques for signature.

Where there is no lack of working capital, and the accounts are regularly and fully paid as the pay day comes round, there is no absolute need for Bought Ledgers at all. In this case the methods described on pp. 77 of this volume might be followed. It must be remembered, however, that it is possible to reduce the clerical work too much, and the absence of Bought Ledgers in cases where the Slip system is in full vogue is not warranted. On the contrary, where the usual Day Book or Journal details are non-existent it is well for the Ledgers to be kept to show a little more information than "By goods," the usual description on the credit side of a Supplier's Account in the Ledger. The account should, by Departmental Letter or otherwise, indicate the class of goods, the volume or quantity, where these have an indifferent ratio to the value. The Ledger Accounts then become something more than mere aids to the preparation of a Statement of Liabilities, affording as they do statistical information as to the volume of trade done with a certain house, and comparisons one season with another, all without appreciable additional cost in compilation. Where Loose-leaf Ledgers are employed, the account will be presented in unbroken continuity for a long period of years.

General.—

It was observed at the opening of this chapter that no complete description of a system of cards was to be essayed. On the one hand, while to do so would require a volume of "The Accountants' Library" to itself, it would on the other seriously limit the scope of the remarks. Such a description must necessarily have a specific industry or business as its objective, and with its own specimen cards, sheets, and forms monopolise the whole space. Further, it is doubtful whether any such com-

pleteness in a handbook of this kind adds much to its utility, it usually being found that any value it possesses lies in its suggestiveness and illustrativeness rather than in its worth as affording a scheme or system of accounting which can be transferred as a whole from out of a text-book into practical working at any business place.

In the foregoing sections devoted to Maltings, Engineering, &c., where cards, sheets, &c., may be safely and profitably utilised, their adoption has been incidentally described and illustrated in the text. The closing chapter may be taken as supplementary and auxiliary to the main sections of the book in the same sense that cards and other loose records judiciously introduced may be regarded as supplementing and complementing the general scheme of factory or commercial accounting and organisation which obtains.

Points Emphasised.—

In conclusion, the following points, some of which have already been incidentally mentioned, are emphasised:—

Consecutive Number.—All cards, where accounting by their means is in practice, should be consecutively numbered. A few "blank numbers" should be retained in the hands of a responsible official for replacements in case of exceptional circumstances.

Cash.—Where cash matters are included in the scheme, "Check Accounts" must be established. Failing this, the risk of irregularity is considerable, and its early detection improbable. Further, in the absence of such check it would be difficult to find a professional auditor who would certify the accounts without his first devoting an amount of time to the work incommensurate with the results. Even with the "checks" referred to, the auditor's responsibility is by no means lessened under a system which includes cash details recorded on cards.

Stocks and Stores.—In the same way, the system must include "Check Accounts" to detect and arrest wastage and loss from whatever cause this may be arising.

Balancing Simplified.—The division and subdivision which may take place with cards, &c., make it a comparatively easy matter to balance the books; the principles of "Self-balancing Ledgers" may be carried to an extent impracticable with bound records.

Safe Custody of the Cards.—In the case of cards representing Customers' Ledger Accounts, Shareholders' Accounts in Register, and all important data, the card cabinets must be constructed sectionally, allowing of convenient removal to the strong room every night. In a large concern the cabinet might be placed on an office wagon or trolley built for the purpose.

Card Furniture.—Care should be exercised in the selection of the office appointments. It is important to see that the special needs of the business are met. In all the large towns there are depôts or agencies of the firms manufacturing office furniture of suitable design, and it is not unusual to find these in charge of experts in the manipulation and employment of cards, &c.

The advertising literature issued by these firms is also well worth studying before finally deciding upon the class of cabinet or drawer to adopt.

It should be pointed out at this stage that it is not necessary to have special furniture for the useful adoption of certain classes of cards. Where the number of things enumerated is limited, and the use to which the information is put merely a useful adjunct to a scheme of office administration already well in hand, a drawer in an ordinary office desk, alphabetically divided, will suffice. The cards in this case will be of no special design, and have no mechanical aids to their ready inspection.

The following are amongst the lectures, &c., on Cards, Loose-leaf Ledgers, and kindred subjects which have appeared in *The Accountant*:—

	Year	Page
"Costing by Sheets and Cards"	1901	483
"Ledger Posting on the Slip System"	1902	256
"Workshop Records"	1902	886
"Card Bookkeeping" (five Articles)	1902	1,069, &c.
"Card Costing: Boot and Shoe Industries" ..	1903	294
"Card Ledgers"	March 1904	320
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"Card Ledgers and Card Index Systems"	Sept. 1904	315
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